Vol. 1070 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

September 16, 1986

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1070 OG 22
Notice of Maintenance Fees Payable	1070 OG 22
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1070 OG 23
Reissue Applications Filed	1070 OG 23
Requests for Reexaminations Filed	1070 OG 23
Erratum	1070 OG 24
Service by Publication	1070 OG 24
Expedited Service for Certified Copies of Trademark Registrations	1070 OG 24
Adverse Decisions in Interference	1070 OG 24
Report on Results of an Oct. 1985—Feb. 1986 Survey on the Citation by Applicants of Information Disclosure Statements in Patent Applications	1070 OG 24
Patent Certificates of Correction	1070 OG 27
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1070 OG 28
Condition of Patent Applications	1070 OG 29
Reexaminations	951
Reissue Patents Granted (32,247)	955
Patents Granted	
General and Mechanical (4,611,353)	957
Chemical (4,612,013)	1191
Electrical (4,612,408)	1301
Design Patents Granted (285,620)	1393
Index of Patentees	PI 1
Indices of Reissue, Reexaminations and Design	PI 49
Classification of	
Patents (Including Reissues and Reexaminations)	PI 53
Designs	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs	PI 58
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Sept. 13, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,403,353 through 4,404,686
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 29, 1986, DUE TO FAILURE TO PAY MAINTEANCE FEES

Patent Number	Serial Number	Issue Date
4,336,622	06/247,514	6/29/82
4,336,624	06/266,508	6/29/82
4,336,795	06/257,862	6/29/82
4,336,818	06/222,037	6/29/82
4,336,921	06/243,461	6/29/82
4,336,933	06/248,830	6/29/82
4,336,934	06/238,807	6/29/82
4,336,938	06/259,002	6/29/82
4,337,044	06/232,333	6/29/82
4,337,119	06/252,946	6/29/82
4,337,122	06/218,023	6/29/82
4,337,128	06/254,955	6/29/82
4,337,151	06/220,775	6/29/82
4,337,232	06/243,824	6/29/82
4,337,238	06/264,595	6/29/82
4,337,271	06/229,215	6/29/82
4,337,322	06/300,210	6/29/82
4,337,328	06/240,440	6/29/82
4,337,345	06/277,568	6/29/82
4,337,352	06/263,812	6/29/82
4,337,358	06/254,000	6/29/82
4,337,359	06/249,241	6/29/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,332,377, Re. S.N. 615,560, Filed May 31, 1984, Cl. 271/293, COMPACT SORTER, R. Clark Du Bois, et al., Owner of Record: *Gradco/Dendoki, Inc., Newport Beach, Calif.,* Attorney or Agent: Newton H. Lee, Jr., Ex. Gp.: 314

4,392,365, Re. S.N. 752,312, Filed July 3, 1985, Cl. 68/19, METHOD FOR TREATING TEXTILE MATERIAL IN CONTINUOUS LENGTH, Mitsuyasu Miyamoto, et al., Owner of Record: *Inventor,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 242

4,405,886, Re. S.N. 876,680, Filed June 20, 1986, Cl. 318/376, BRAKING CONTROL, Dennis Francis Williamson, Owner of Record: *Urban Transportation Development Corp., Kingston, Ontario, Canada,* Attorney or Agent: Bert J. Lewen, et al., Ex. Gp.: 217

4,435,852, Re. S.N. 839,040, Filed Mar. 12, 1986, Cl. 2/436, GOGGLE, Todd G. Nesler, Owner of Record: *Inventor,* Attorney or Agent: Steven L. Oberholtzer, et al., Ex. Gp.: 247

4,439,934, Re. S.N. 849,383, Filed Apr. 3, 1986, Cl. 36/44, ORTHOTIC INSERT, Dennis N. Brown, Owner of Record: *Northwest Podiatric Laboratories, Inc., Blaine, Wash.,* Attorney or Agent: Robert B. Hughes, et al., Ex. Gp.: 247

4,453,344, Re. S.N. 872,140, Filed June 9, 1986, Cl. 47/85, SEEDLING PROPAGATING CONTAINER AND METHOD, Aart V. Wingerden, Owner of Record: *Inventor,* Attorney or Agent: Ralph Bailey, et al., Ex. Gp.: 331

4,457,867, Re. S.N. 881,759, Filed July 3, 1986, Cl. 260/112.5R, PHYSIOLOGICALLY ACTIVE PEPTIDE, Torao Ishida, Owner of Record: *Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Frank F. Scheck, Ex. Gp.: 153

4,458,434, Re. S.N. 877,496, Filed June 23, 1986, Cl. 40/513, CONTAINER FOR PICTURES HAVING SIMILAR FORMATS, Peter Ackeret, Owner of Record: *Licinvest AG, Chur, Switzerland,* Attorney or Agent: Ralph H. Chilton, Ex. Gp.: 333

4,458,593, Re. S.N. 883,185, Filed July 8, 1986, Cl. 101/383, INDICIA PLATE FOR A POSTAGE METER, Danilo P. Buan, et al., Owner of Record: *Pitney Bowes, Inc., Stamford, Conn.,* Attorney or Agent: Peter Vrahotes, et al., Ex. Gp.: 337

4,460,585, Re. S.N. 884,765, Filed July 11, 1986, Cl. 514/245, 1-ARYL-4 HYDRAZINYL-S-TRIAZIN-2-ONES, George H. Douglas, et al., Owner of Record: *William H. Rorer, Inc., Fort Washington, Pa.,* Attorney or Agent: James A. Nicholson, et al., Ex. Gp.: 125

4,474,365, Re. S.N. 876,261, Filed June 19, 1986, Cl. 271/3, DOCUMENT FEEDING, HANDLING AND COUNTING APPARATUS, John DiBlasio, Owner of Record: *Brandt, Inc., Watertown, Wis.,* Attorney or Agent: Louis Weinstein, Ex. Gp.: 314

4,521,074, Re. S.N. 886,030, Filed July 16, 1986, Cl. 350/145, BINOCULAR PRESENTATION OF VISUAL INFORMATION, Patrick G. Kalaugher, Owner of Record: *University of Exeter, Devon, England,* Attorney or Agent: Andrew E. Taylor, et al., Ex. Gp.: 257

4,546,589, Re. S.N. 881,771, Filed July 3, 1986, Cl. 52/518, SINGLE-PLY SEALED MEMBRANE ROOFING SYSTEM, Richard N. Seaman, Owner of Record: *Seaman Corp., Millersburg, Ohio,* Attorney or Agent: Jack L. Renner, et al., Ex. Gp.: 354

4,546,810, Re. S.N. 880,721, Filed July 1, 1986, Cl. 256/22, METHOD FOR THE MANUFACTURE OF MOLDS USING CASTING SAND OR ANOTHER MIXTURE OF RAW MATERIAL PARTICLES, Christoph Landolt, Owner of Record: *George Fischer Foundry Systems, Inc., Holly, Mich.,* Attorney or Agent: Ernest F. Marmorek, et al., Ex. Gp.: 351

4,555,221, Re. S.N. 869,668, Filed June 2, 1986, Cl. 374/181, FLUID PUMPING DEVICE FOR USE WITH A FLUID PUMP, Chester G. Dubois, Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Robert E. Clemency, et al., Ex. Gp.: 246

4,588,931, Re. S.N. 886,209, Filed July 16, 1986, Cl. 318/7, TENSION CONTROL FOR WEB HANDLING APPARATUS, William J. Alexander, III, Owner of Record: *Inventor,* Attorney or Agent: Ralph Bailey, et al., Ex. Gp.: 217

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive no-

tice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Erratum

"All reference to Patent No. 4,606,969, to David L. Hedgecoth of Cookeville County, Tenn., for MICROPOROUS MARKING STRUCTURES AND METHOD, appearing in the Official Gazette of Aug. 19, 1986, should be deleted since no patent was granted."

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Iron-Woods, Inc., Chicago, Ill., Reg. No. 1,058,585, for the mark "TOURING PRO", Canc. No. 15,342.

Modesto Fruit Exchange, Modesto, Calif., Reg. No. 224,870, for the mark "CARAVAN", Canc. No. 15,360

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Expedited Service for Certified Copies of Trademark Registrations

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registrations will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crystal Plz. 2–4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2–4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Plz. 2–3C06
(703) 557–3268

Aug. 19, 1986.

MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,012,449, Yoshihisa Shikakura, Fumio Sakai and Hitoshi Shimizu, PRODUCTION OF METHACROLEIN AND OXIDATION CATALYST USED THEREFOR, Interference No. 101,495, decided July 21, 1986, claims 3, 4 & 6.

Patent No. 4,294,756, Hans-Peter Kuhlthau, CATIONIC DYESTUFFS, Interference No. 101,532, decided Aug. 4, 1986, claims 1–10.

Patent No. 4,421,588, Glyndwr J. Davies, PLASTICS ALLOY COMPOSITIONS, Interference No. 101,453, decided June 20, 1986, claims 8–11.

Patent No. 4,423,071, Michel Chignac, Claude Grain, Fernand Jammot, Charles Pigerol, Pierre Eymard and Bernard Ferrandes, POLYOL DERIVATIVES, PROCESSES FOR PREPARING THE SAME AND THEIR USES IN THERAPEUTICS, Interference No. 101,397, decided July 1, 1986, claims 1–6.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Report on Results of an Oct. 1985—Feb. 1986 Survey on the Citation by Applicants of Information Disclosure Statements in Patent Applications

This report summarizes the data compiled from a sample of 1200 allowed utility applications surveyed in the Office of Quality Review during the period of Oct. 1, 1985 to Feb. 14, 1986.

For purposes of the survey, a "citation", whether appearing in the specification or in a separate paper, is defined as either (1) a listing of patents or publications together with a concise explanation of the relevance of each listed item (i.e. an "information disclosure statement" under 37 CFR 1.98(a)), or (2) a "mere listing" of patents or publications. In addition, a "reference", or "document", is defined as any patent or other publication cited by applicant.

This survey report is similar to and presented in the same general format as the survey reports published in the Official Gazette of Nov. 23, 1976, pages 1356 and 1357, of Sept. 26, 1978, pages 22 and 23, and of Aug. 12, 1980, pages 8 and 9. It should be noted, however, that the phrase "prior art statement" used throughout the three previous survey reports has been replaced by the more appropriate phrase "information disclosure statement" reflecting the current terminology of 37 CFR 1.97–1.99 as amended.

This survey indicates, among other things, that 60% of the sampled applications include citations by applicants. This is somewhat less than the 63% finding in the survey reported in the 1980 O.G. and the 64% finding in the 1978 survey but still represents an improvement over the 54% finding in the 1976 survey. In addition, more

citations are being submitted later in the prosecution than previously. The percentage of applications having citations submitted in separate papers has increased while the percentage of applications having such papers submitted within three months of the filing of an application is down from 79% in 1978 and 73% in 1979 to 53% presently. Also, while the percentage of applications having citations accompanied by copies of references cited has increased, overall compliance with Office guidelines has decreased.

A separate, recent informal review of citations made after allowance similarly indicated frequent noncompliance with the guidelines of Section 609 of the Manual of Patent Examining Procedure. Often, citations were in the form of prior art search reports made by foreign patent offices many months or years earlier, submitted without copies of t he references, discussion of materiality, or any explanation for the late submission. The Office is presently considering action to remedy these problems.

The statistics are otherwise presented without comment as follows:

		Chem.	Elec.	Mech.	Total
(1)	Number of applications in sample	350	415	435	1200
	(Percent of total sample)	29%	35%	36%	100%
	Number of applications having citations submitted in:				
(2)	Separate papers only	69	82	82	233
	(Percent of sample 2/1)	20%	20%	19%	19%
(3)	Both separate paper *and* in specification	41	60	44	145
	(Percent of sample 3/1)	12%	14%	10%	12%
(4)	The specification only	121	94	121	336
	(Percent of sample 4/1)	35%	23%	28%	28%
(5)	Total number of applications having citations	231	236	247	714
	(Percent of sample 5/1)	66%	57%	57%	60%

Applications in which the applicant submitted citations in the *specification*.

		Chem.	Elec.	Mech.	Total
(6)	Number of applications including citations in the specification	162	154	165	481
	(Percent of applications having citations in the specification 6/1)	46%	37%	38%	40%
(7)	Number of applications including mere listing of references in the specification	12	6	17	35
	(Percent of applications having mere listing of references in the specification 7/1)	3%	1%	4%	3%
(8)	Number of applications including information disclosure statements in the specification	150	148	148	446
	(Percent of applications having disclosure statements in the specification 8/1)	43%	36%	34%	37%
(9)	Number of applications including information disclosure statements in the specification which included copies of the references	67	55	65	187
	(Percent of applications, with disclosure statements in the specification, having copies of the reference 9/8)	45%	37%	44%	42%
(10)	Number of applications including information disclosure statements in the specification which comply fully with the guidelines (37 CFR 1.97–1.99; MPEP §609) (e.g. timely filed, translations where applicable, etc.)	46	45	40	131
	(Percent of applications, with disclosure statements in the specification, which fully comply with CFR and MPEP 10/8)	31%	30%	27%	29%
(11)	Number of applications including information disclosure statements citing non-English documents in the specification	60	36	31	127
	(Percent of applications, with disclosure statements in the specification, citing non-English documents 11/8)	40%	24%	21%	28%

Applications in which applicant submitted citations in *separate papers*.

		Chem.	Elec.	Mech.	Total
(12)	Number of applications including citations in a separate paper	110	142	126	378
	(Percent of applications having citations in separate papers 12/1)	31%	34%	29%	32%

(13)	Number of applications including separate paper citations submitted within 3 months of the filing date of the application	48	88	65	201
	(Percent of separate paper citations submitted within 3 months 13/12)	43%	62%	52%	53%
(14)	Number of applications including separate paper citations which include a copy(s) of the reference(s)	103	134	114	351
	(Percent of separate paper citations including copy(s) of the reference(s) 14/12)	94%	94%	90%	93%
(15)	Number of applications including separate paper citations which cited a non-English document	47	53	43	143
	(Percent of separate paper citations citing non-English documents 15/12)	43%	37%	34%	38%
(16)	Number of applications including separate papers with information disclosure statements	88	100	81	269
	(Percent of separate paper citations having disclosure statements 16/12)	80%	70%	64%	71%
(17)	Number of applications including separate paper citations which fully comply with the guidelines (37 CFR 1.97–1.99; MPEP §609)	31	58	37	126
	(Percent of separate paper citations which fully comply with CFR and MPEP 17/12)	28%	41%	29%	33%

Applications in which applicant submitted *more than ten* citations.

		Chem.	Elec.	Mech.	Total
(18)	Number of applications having more than ten citations	32	25	22	79
	(Percent of applications having more than ten citations 18/1)	9%	6%	5%	7%

Aug. 15, 1986.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 16, 1986

PP. 5,640	4,546,510	4,569,820	4,586,181
D. 279,197	4,547,369	4,570,225	4,587,016
D. 280,395	4,549,581	4,571,191	4,587,163
4,001,323	4,549,880	4,571,700	4,587,476
4,041,956	4,549,919	4,571,906	4,587,737
4,125,310	4,550,367	4,575,526	4,587,747
4,327,753	4,550,432	4,575,916	4,588,063
4,371,688	4,550,617	4,576,071	4,588,154
4,390,375	4,552,605	4,576,713	4,588,616
4,421,554	4,552,738	4,577,372	4,588,723
4,425,433	4,552,883	4,577,570	4,588,869
4,441,760	4,553,821	4,578,421	4,589,226
4,459,890	4,554,438	4,578,452	4,589,774
4,460,678	4,554,975	4,579,096	4,590,082
4,477,178	4,555,085	4,579,425	4,590,581
4,482,214	4,555,444	4,580,259	4,590,857
4,486,755	4,555,706	4,580,549	4,591,463
4,489,991	4,556,110	4,580,624	4,592,269
4,491,016	4,556,175	4,580,825	4,592,540
4,493,036	4,556,405	4,581,265	4,592,754
4,496,629	4,556,508	4,581,549	4,592,872
4,500,712	4,556,790	4,581,893	4,593,054
4,501,807	4,558,332	4,581,970	4,593,231
4,502,246	4,558,356	4,582,285	4,593,506
4,504,060	4,558,471	4,582,594	4,593,719
4,504,372	4,558,710	4,582,695	4,593,730
4,509,477	4,559,133	4,582,867	4,593,745
4,515,666	4,559,543	4,583,019	4,594,090
4,515,704	4,559,797	4,583,321	4,594,154
4,515,930	4,559,870	4,583,395	4,594,396
4,523,662	4,560,197	4,583,568	4,594,409
4,528,579	4,562,876	4,583,865	4,594,896
4,530,866	4,563,700	4,584,201	4,595,588
4,533,434	4,563,715	4,584,222	4,595,600
4,535,007	4,564,762	4,584,296	4,596,680
4,535,923	4,565,436	4,584,373	4,596,770
4,536,884	4,565,989	4,584,436	4,597,240
4,543,391	4,566,460	4,584,599	4,598,369
4,544,580	4,567,988	4,585,383	4,598,378
4,545,486	4,568,576	4,585,777	4,598,440
4,546,449	4,568,742	4,585,871	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 2, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	3-20-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-24-84
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,458,863 to 3,464,062, inclusive

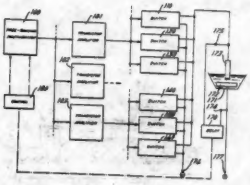
Plant Patents . . . . . Numbers 2,914 to 2,917 inclusive

REEXAMINATIONS

SEPTEMBER 16, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,360,683 (562nd)
SOLID-STATE PULSE GENERATOR FOR ELECTRIC-DISCHARGE MACHINING
Kiyoshi Inoue, 100 Sakato, Kawasaki, Kanagawa, Tokyo, Japan
Reexamination Request No. 90/000,773, May 6, 1985.
Reexamination Certificate for Patent No. 3,360,683, issued Dec. 26, 1967, Ser. No. 493,473, Oct. 6, 1965.
Int. Cl.[4] B23P *1/08*
U.S. Cl. 315—209 R

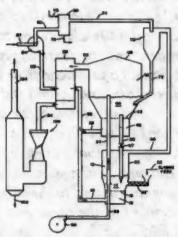


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1–2** is confirmed.

1. In an apparatus for machining a conductive workpiece by intermittent electrical discharge across a gap between an electrode and the workpiece in the presence of a dielectric coolant, a machining power circuit for supplying machining power pulses to said gap comprising a power supply, a periodically operated electronic switching means having principal electrodes connected in a series circuit between said power supply and said gap, a variable magnitude resistor connected in said series circuit with said gap, current sensing means coupled to said series circuit for providing an output signal responsive to abnormal gap characteristic, and means coupling said sensing means to said resistor for selectively increasing the magnitude of said resistor to limit gap current flow responsive to said signal.

B1 4,159,682 (563rd)
FLUID BED COMBUSTION WITH PREDRYING OF MOIST FEED USING BED SAND
Elliot B. Fitch, Pittsburgh, Pa., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.
Reexamination Request No. 90/000,804, Jun. 18, 1985.
Reexamination Certificate for Patent No. 4,159,682, issued Jul. 3, 1979, Ser. No. 856,379, Dec. 1, 1977.
Int. Cl.[4] F23G *5/00, 7/00, 5/04*
U.S. Cl. 110—245



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

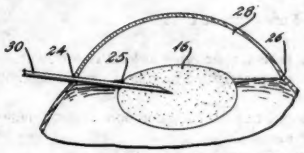
Claims **5, 7, 11–13, 16–29, 32** and **33** are cancelled.

Claims **1, 8, 14, 30** and **31** are determined to be patentable as amended.

Claims **2–4, 6, 9, 10** and **15**, dependent on an amended claim, are determined to be patentable.

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a fluidized bed of hot, inert, particulate material for combustion comprising, withdrawing a quantity of said hot particulate material from said fluidized bed, intimately contacting said moist feed with said hot particulate bed material to evaporate the water in the feed at a [relatively low] temperature *in the range from 80° C. to 180° C. without any substantial addition of air*, separating the dried solids from the gas stream containing the evaporated water, charging the separated dried feed and the particulate bed material associated therewith into said fluidized bed for combustion, treating the separated gas stream to remove and dispose of the water vapor therein and forwarding the balance of the separated gas stream for further use in the process.

B1 4,078,564 (564th)
INTRALENTICULAR CATARACT SURGERY
Joseph Spina, 767 Woodlea Rd., Bryn Mawr, Pa. 19010, and Michael K. Weibel, 605 S. 48th St., Philadelphia, Pa. 19143
Reexamination Request No. 90/000,853, Sep. 11, 1985.
Reexamination Certificate for Patent No. 4,078,564, issued Mar. 14, 1978, Ser. No. 660,873, Feb. 24, 1976.
Int. Cl.[4] A61M *31/00*; A61B *19/00*; A61K *37/48*; A61B *17/00*
U.S. Cl. 604—51



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **5** are determined to be patentable as amended.

Claims **2–4**, dependent on an amended claim, are determined to be patentable.

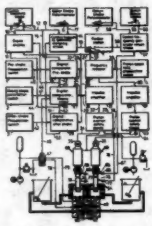
1. A method for enzymatically treating cataracts in vivo which comprises injecting a concentrated solution of at least one exogenous lens digesting enzyme directly into the lens of an eye, *confining the enzyme solution within the lens,* then allowing enzymatic digestion of the lens to take place and thereafter removing the enzyme digested lens material.

B1 4,275,822 (565th)

APPARATUS FOR METERING AT LEAST TWO REACTION COMPONENTS INTO A MIXING CHAMBER

Richard Juffa, Cologne, and Heinrich Boden, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Reexamination Request No. 90/000,314, Jan. 12, 1983.
Reexamination Certificate for Patent No. 4,275,822, issued Jun. 30, 1981, Ser. No. 2,,774, Jan. 11, 1979.
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805946
Int. Cl.[4] B67D 5/08
U.S. Cl. 222—63



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–3 are cancelled.

1. An apparatus for metering at least two flowable reaction components in a preselected ratio into a mixing chamber comprising:

(A) a metering unit for each component, each metering unit comprising:

(i) a metering piston and a cylinder,

(ii) a feed pipe leading from a storage container into said cylinder,

(iii) a delivery pipe leading from said cylinder to said mixing chamber, and

(iv) a drive unit in the form of an electro-hydraulic linear amplifier comprising a stepping motor for a control mechanism which is coupled to a hydraulic piston and cylinder, wherein said drive unit is capable of driving said metering piston, and

(B) control electronics for controlling said metering units, said control electronics comprising:

(i) at least one adjustable control frequency generator for generating signals to be fed to said electrohydraulic linear amplifiers to control the movement of said metering pistons,

(ii) a first means of conducting said signals to at least one of said electro-hydraulic linear amplifier, and

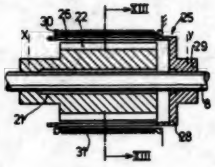
(iii) a second means for conducting said signals to all other electrohydraulic linear amplifers via an adjustable frequency reducer.

B1 4,356,732 (566th)

TORQUE AND TORSION ANGLE MEASURING APPARATUS

Hansjörg Hachtel, Weissach, and Klaus Dobler, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Reexamination Request No. 90/000,834, Aug. 12, 1985.
Reexamination Certificate for Patent No. 4,356,732, issued Nov. 2, 1982, Ser. No. 213,589, Dec. 5, 1980.
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951148
Int. Cl.[4] G01L 3/10
U.S. Cl. 73—862.33



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–20 are cancelled.

New claims 21–29 are added and determined to be patentable.

21. Torque and torsion angle measuring apparatus comprising shaft (8) having an input end portion (7) and an output end portion;

a first essentially cylindrical induction member (21) concentric with said shaft and mounted on said input end portion for rotation therewith, said first induction member having cylindrical, electrically conductive portions and intervening insulating portions formed on the surface thereof;

a second cylindrical induction member, mounted on said output end portion, surrounding and overlapping said first cylindrical induction member, said second cylindrical induction member having electrically conductive portions and electrically insulating portions, said electrically conductive and electrically insulating portions overlapping corresponding cylindrical conductive and insulating portions of said first induction member to a predetermined extent;

and a cylindrical coil (30) closely surrounding said second induction member, and at least approximately concentric with said shaft, so that a magnetic field generated by said coil creates eddy currents in said second induction member varying in dependence on the relative alignment of the electrically conductive portions of said first and said second cylindrical concentric induction members, to effect a change in inductivity upon said coil upon change in eddy currents, in dependence on said alignment, and to thereby provide a measure of angular displacement of the input end portion to the output end portion of said shaft.

B1 4,470,600 (567th)

GOLF CLUB

Richard E. Parente, Palm Springs, and Richard De La Cruz, Pauma Valley, both of Calif., assignors to Hickory Stick USA, Temecula, Calif.

Reexamination Request No. 90/000,921, Dec. 9, 1985.
Reexamination Certificate for Patent No. 4,470,600, issued Sep. 11, 1984, Ser. No. 386,931, Jun. 10, 1982.
Int. Cl.[4] A63B *53/02, 53/10*
U.S. Cl. 273—80 B

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–18**, dependent on an amended claim, are determined to be patentable.

1. A golf club, comprising

(a) [an outer wood hollow tube] *an outer solid natural wood hollow tube having structural characteristics corresponding to those resulting from having been made by boring and turning a larger piece of solid natural wood, which is distinctly different from man made laminated wood, and* having a bore of substantially uniform diameter from end to end thereof,

(b) an inner rigid non-wood hollow tube positioned inside of and closely fitting the interior of said outer tube throughout at least the major extent of the length of said outer tube and said inner tube having a substantially uniform interior diameter and a substantially uniform exterior diameter throughout at least the major extent of the length

of said inner tube,

(c) an adhesive between the interior of said outer tube and the exterior of said inner tube bonding them together, and

(d) a separate club head fastened to the lower end of said inner rigid non-wood hollow tube.

REISSUES

SEPTEMBER 16, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,247

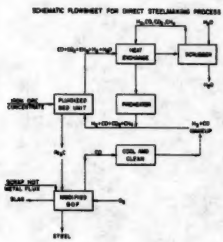
PROCESS FOR THE DIRECT PRODUCTION OF STEEL

Frank M. Stephens, Jr., Lakewood, Colo., assignor to Hazen Research, Inc., Golden, Colo.

Original No. 4,053,301, dated Oct. 11, 1977, Ser. No. 622,101, Oct. 14, 1975. Application for reissue Apr. 2, 1985, Ser. No. 719,967

Int. Cl.[4] C21C *5/52*; C22B *1/10*

U.S. Cl. 75—11 94 Claims



1. A process for the direct production of steel from iron oxides which comprises:

a converting the iron in the oxides to iron carbide *by reducing the oxides and converting the iron to iron carbide in one step in a fluidized bed with a mixture of hydrogen-bearing gas and a carbon-containing material where the hydrogen serves only as a reducing material and the carbon-containing material serves only to provide carbon for the iron carbide*; and

b. converting the iron in the iron carbide directly to steel in [the basic oxygen] *a steelmaking* furnace.

Re. 32,248

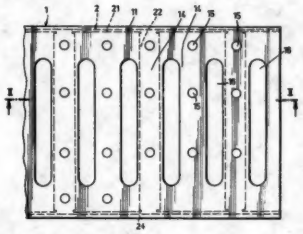
GRATE FOR DRAINAGE DUCTS

Peter Blecher, Hagen, Fed. Rep. of Germany, assignor to TWB-Pressteile GmbH, Hagen, Fed. Rep. of Germany

Original No. 4,367,142, dated Jan. 4, 1983, Ser. No. 360,889, Mar. 22, 1982. Application for reissue Jan. 23, 1984, Ser. No. 573,306

Int. Cl. E03F *5/14*

U.S. Cl. 210—163 11 Claims



1. In a ladder-like grate made of sheet steel for use in drainage ducts, which grate includes a main surface portion and opposed, upright longitudinal edges extending along respective longitudinal sides of the main surface portion, each edge including a part which is angled toward the other longitudinal edge, the grate further including supporting bars extending between the longitudinal edges and formed to define inlet slits each extending between the longitudinal edges and each located between two adjacent supporting bars, the grate further being formed to present, around each slit, a folded-down edge establishing an inlet surface oriented obliquely to the main surface portion, the improvement wherein said grate comprises sheet steel inner and outer components one of which is provided with said slits and each of which is provided with said supporting bars, and wherein said inner component includes longitudinal bars extending along opposite sides thereof, said outer component includes angled longitudinal edge parts extending along opposite sides thereof, and said components are assembled together with said inner component within said outer component, said longitudinal bars held in said longitudinal edge parts, and said supporting bars of said inner component resting against those of said outer component.

PATENTS

GRANTED SEP. 16, 1986

ERRATA

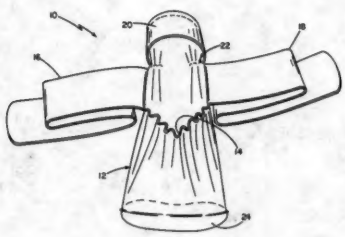
For CLASS	See PATENT NO.
242–129	4,611,645
118–323	4,611,695
296–001	4,611,796
384–049	4,611,861
384–095	4,611,862
357–080	4,611,882
425–131	4,611,987
065–032	4,612,023
420–083	4,612,047
558–282	4,612,143
502–028	4,612,293

PATENTS

GRANTED SEPTEMBER 16, 1986

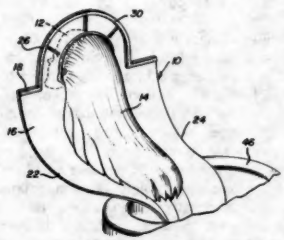
GENERAL AND MECHANICAL

4,611,353
INFANT'S GARMENT
Heidelise Als, Brookline, and Annie Zeybekoglu, Boston, both of Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.
Filed Jul. 2, 1984, Ser. No. 626,685
Int. Cl.[4] A41B *1/12*
U.S. Cl. 2—69 **8 Claims**



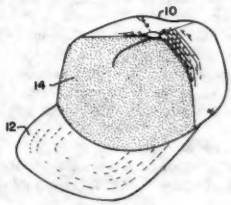
1. An infant's garment comprising
a sack portion adapted to receive the legs of an infant and having a left and right side, and
two elongated, pliable flaps attached to said sack portion and extending from the left and right sides of said sack portion at locations permitting them to wrap around and gently bind the infant's arms, said flaps being sufficiently long to overlap behind the body of said infant.

4,611,354
HAIR SHAMPOO FACE AND BODY SHIELD
Virginia C. Jones, 4363 E. Montclair Cir., Mobile, Ala. 36609
Filed Jan. 23, 1985, Ser. No. 694,145
Int. Cl.[4] A45D *44/08*
U.S. Cl. 2—174 **5 Claims**



1. A face and body shield for persons having their hair shampooed, said shield including an elongated flexible and at least water repellent panel including opposite first and second transverse end margins and opposite side longitudinal margins extending between corresponding ends of said first and second transverse margins, said first transverse margin including at least a central portion thereof which is outwardly convex curved and includes first stiffening means extending therealong, said panel including a substantially circular opening formed therein spaced inwardly of said first margin central portion, the marginal edges of said panel extending about and defining said opening being gathered and having elastic means anchored relative thereto and extending therealong, and second stiffening means carried by the portion of said panel disposed between said central portion of said upper margin and the adjacent portions of said marginal edges extending about said opening, said second stiffening means including elongated areas of said panel disposed generally along radii of the center of said opening, said elongated areas including elongated stiffening members supported therefrom.

4,611,355
CONVERTIBLE PATCHES FOR APPAREL
Charles Galanto, Box 15741, Honolulu, Hi. 96815, and Charles R. Lundy, 59-787C Kam Hwy., Haleiwa, Hi. 96712
Filed Nov. 16, 1984, Ser. No. 671,956
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—246 **2 Claims**



1. In combination,
(a) a cap consisting of a hemispherical head covering portion with a substantially circular lower edge and first and second half sections, each section being of substantially similar size and being so connected to form an integral unit, and a substantially rigid visor member having an arcuate back edge, said visor member extending substantially orthogonally from the lower edge of said first section, said visor member having an upper and lower surface, and said back edge being connected to and substantially coextensive with said first section, and the outer surface of said first section and visor member consisting essentially of a layer of a multitude of minute woven loops,
(b) a plurality of patches having a first surface bearing indicia and a second surface opposite said first surface, where said second surface consists essentially of a multitude of minute hooks, and
(c) where said loop layer and said hooked surface constitute coacting components of a separable fastener upon juxtaposing and pressing said hook surface onto said loop layer whereby the patches are removable fastened to said loop layer, and where a plurality of indicia are simultaneously displayable on said cap.

4,611,356
FLUSHING APPARATUS FOR URINALS
Yeh-Huong Lin, I Lan Hsien, Taiwan, assignor to Hocheng Pottery Mfg. Co., Ltd., Taipei, Taiwan
Filed Apr. 11, 1985, Ser. No. 721,953
Int. Cl.[4] E03D *13/00*; F16K *31/06*
U.S. Cl. 4—301 **2 Claims**

1. A flushing apparatus for urinals having a dual flushing actuating capability comprising:
a flush pipe;
a housing having an upper side, an inner wall and a bore in said upper side, said housing including:
a first passage, a first flush defined by said first passage, hole a second passage, a second flush hole defined by said second passage, in said inner wall, said first passage

and said second passage operatively communicating with said flush pipe;

said housing including water regulating means for regulating the water flow flowing through said first passage and second passage;

a manual flush device including:

a button, said button mounted in said housing so that a portion of said button protrudes outwardly of said housing;

means for biasing said button so that a portion of said button protrudes outwardly of said housing;

a push rod pivotally joined with said button and forwardly extending through said second flush hole in said inner wall of said housing to the end thereof; the diameter of the second flush hole being larger than that of said push rod;

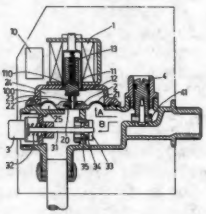
a stop valve having a first and second end, said stop valve having a diameter larger than that of said second flush hole, said first end of said stop valve mounted at one end of said push rod, said second end of said stop valve conforming to the sides of said second flush hole;

a sealing gasket provided about the said second end said stop valve;

whereby when said button is pushed, said push rod will push said stop valve away from said second flush hole to thereby open said second passage until said manual button is released;

an automatic flush device including:

an electromagnetic actuated valve assembly mounted on external side of said housing, said assembly including:



a valve stem vertically mounted in said electromagnetic valve, said valve stem having a lower portion;

a first spring for biasing said valve stem whereby said biased valve stem extends through said bore into said housing;

said valve assembly adapted to be controlled by an infra red emitting-and-detecting control device mounted outside of said housing,

a infra red control device having means for emitting an infra red ray and detecting said ray as reflected from a human body and having, after a predetermined first time, means for actuating said electromagnetic valve to open said first passage and after a predetermined second time to close said first passage,

a pressure sensing film having a central level portion,

a pressure releasing hole at the center of said central level portion and a ring flange about said central level portion, with at least one pressure balancing hole provided in said ring flange, the diameter of said at least one pressure balancing hole being smaller than that of said pressure releasing hole, said pressure releasing hole mounted and positioned below said valve stem so that the underside of said lower portion of said valve stem is butts against said pressure releasing hole,

the assembly of said pressure sensing film and said valve stem dividing space within said first passage into an upper chamber and a lower chamber, each chamber being adapted to receive, contain and release water, said central level portion of said pressure sensing film tightly covering said first flush hole,

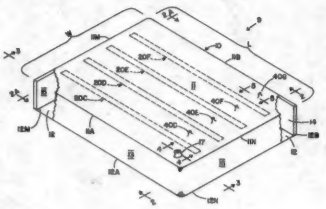
whereby when said electromagnetic valve is actuated by said control device said valve stem is moved to open said pressure releasing hole, the water filled in said upper chamber will rapidly drain out through said pressure releasing hole and said pressure sensing film will be expanded by the water pressure in said lower chamber to open said first passage until said electromagnetic valve is deactivated by said control device.

4,611,357

FLOTATION SLEEPING MATTRESS CONSTRUCTIONS

Steven C. Chelin, 8612 Makaha Cir., Papillion, Nebr. 68128

Filed Jun. 24, 1985, Ser. No. 747,580
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—451 5 Claims



1. In a flotation sleeping mattress of the fluid-inflatable type externally defined by six substantially rectangular flexible fluid-impervious resinous external panels including: two broad-panels including a top-panel overlying a dimensionally similar bottom-panel and both comprising four lineal edges including a pair of substantially parallel lengthier longitudinal-edges defining therebetween a finite lateral-width for the mattress top-panel and a pair of substantially parallel shorter lateral-edges defining therebetween a finite longitudinal-length for the mattress top-panel; two dimensionally similar and longitudinally extending side-panels and each having fluid-impervious connections of said finite longitudinal-length along respective longitudinal-edges of the broad-panels; and two dimensionally similar and laterally extending end-panels and each having lineal fluid-impervious connections of said finite lateral-width along respective lateral-edges of the broad panels, the improvement of:

(A) a plurality of substantially parallel flexible rectangular baffle-panels of the fluid-impervious resinous type, each said baffle-panel being substantially parallel to a said side-panel and bearing a ratio within the range of 0.90 to 0.99 as compared to said finite longitudinal-length, and each such baffle-panel having linearly extending continuous fluid-impervious connections to the broad-panels, whereby said parallel baffle-panels provide a plurality of linearly extending and solely terminally communicating internal chambers within said fluid-inflatable mattress and wherein such baffle-panels partitions resist abrupt fluid displacements directionally normal thereto whenever the mattress occupant moves along a plane overlying the mattress top-panel, and the said baffle-panels being located at laterally consecutive regular-intervals of about four to eight inches and whereby said lateral-width bears a ratio of at least about eight as compared to the baffle-panels regular-intervals; and

(B) a fluid filling spout equipped with a removable cap and said spout extending through the mattress into one internal chamber, and resinous air-relief valves in structurally continuously attached condition to the top-panel and each being relegated to communication with respective of the remaining internal chambers, each said resinous air-relief valve comprising a flexible valve tube with a lower flapper valve and an upper cap, said valve tube being connected to the top panel with a flexible extension and being vertically movable to assume positions above and below the top-panel whereby when a pinching pressure is ex-

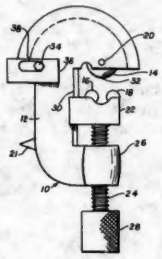
erted on the upper portion of the valve, tube a flapper valve gap is established permitting the purging of air bubbles.

4,611,358

DEVICE FOR TUBE CUTTING, REAMING AND BENDING

Mark Mills, 50 Rena Ave., and Darrell Mills, 33 Mindy Ct., both of Erie, Pa. 16510

Filed Apr. 9, 1985, Ser. No. 721,441
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—157 **20 Claims**



1. A hand held device for cutting and bending tubing comprising:

a bender body member having a first end, a second end and a tubing guide track supported on said first end,

a bender bracket having a bender flange, and

a rotatable cutting wheel,

said bender bracket being adjustably connected to said bender body member adjacent said first end,

said rotatable cutting wheel being supported by said bender body member adjacent said first end,

roller means,

a roller support rotatably supporting said roller means on said body adjacent said second end thereof and adjacent said cutter wheel for cutting tubing,

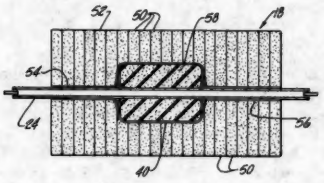
said bender flange being positioned adjacent to said tubing guide track whereby tubing fed between said bender flange and said tubing guide track is held by said bender flange as said tubing is bent into said tubing guide track.

4,611,359

TOP BRUSH CONSTRUCTION WITH INFLATABLE CENTER SECTION

David J. Bivens, Danville, Va., assignor to Bivens Winchester Corporation, Danville, Va.

Continuation-in-part of Ser. No. 572,116, Jan. 19, 1984, Pat. No. 4,547,922. This application Oct. 26, 1984, Ser. No. 665,183
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—97 B **6 Claims**



1. A rotary brush like device for vehicle washing system comprising:

a support shaft having a given length;

radially resilient cushion means in the form of a foam body mounted centrally of such shaft but of lesser length than said shaft;

a first plurality of radially extending scrubber elements mounted on and over said radially resilient foam body;

second and third plurality of radially extending scrubber elements mounted on and over the end segments of said support shaft are outboard of but contiguous with said resilient foam body;

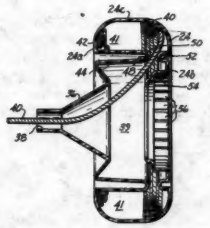
the first second and third pluralities of scrubber elements being of such effective radial length as to produce a uniform overall diameter of said brush like device over the entire length thereof.

4,611,360

PIPE CLEANING MACHINE

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342

Filed Nov. 15, 1984, Ser. No. 671,621
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.3 SN **7 Claims**



1. A pipe cleaning machine of the type characterized by having an elongated flexible plumbers snake, or spring, formed of helically wound spring wire which is stored within the machine in a coiled configuration and can be withdrawn forwardly of the machine for insertion in to the pipe to be cleaned, comprising:

(a) a frame;

(b) a one-piece integrally formed, molded drum rotatably mounted on said frame including:

(1) a front wall;

(2) a rear wall;

(3) a curved peripheral portion;

(4) a generally frustoconically shaped forward guide portion adapted to accommodate passage of the spring therethrough; and

(5) a pair of spaced apart wall portions integrally formed with and extending inwardly from said front wall, said wall portions being disposed radially inwardly of said peripheral portion and cooperating therewith to define a substantially closed spring storage portion, said wall portions being interconnected by an end wall portion spaced from said rear wall a limited distance to define a guide passageway of a predetermined limited size for guiding passage of the snake between said spring storage portion and said forward guide portion; and

(c) drive means for rotating said drum.

4,611,361

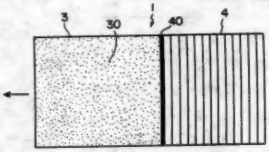
SHEET MATERIALS FOR CLEANING CONVEYING ROLLS AND GUIDES OF A FACSIMILE APPARATUS

Takashi Shinkai, Tokushima, Japan, assignor to Purely Hanbai Co., Ltd. and Awa Paper Manufacturing Co., Ltd., both of Tokushima, Japan

Filed Mar. 7, 1985, Ser. No. 709,287
Claims priority, application Japan, Mar. 9, 1984, 59-34401[U]
Int. Cl.[4] A47L *13/17*
U.S. Cl. 15—104.93 **7 Claims**

1. A sheet material for cleaning the surface of the paper conveying rolls and the inside surface of the guides of a facsimile apparatus, wherein the cleaning is performed by inserting said sheet material into the facsimile apparatus in place of the copy to be transmitted or the paper used for recording messages received, said sheet material being made up of an impreg-

nated sheet and an absorbent sheet coupled to the rear end of said impregnated sheet, said impregnated sheet being characterized by having been impregnated with a cleaning fluid and having a sufficient stiffness such that it can be conveyed by the paper conveying rolls, as well as having a sufficient compressibility such that when the impregnated sheet is clasped between the paper conveying rolls and pressed, the cleaning fluid becomes squeezed out to adhere to the surface of the paper conveying rolls; and said absorbent sheet being characterized by having the function of absorbing the cleaning fluid that adheres to the surface of the paper conveying rolls, as well as having a structure enabling it to contact the inside surface of the conveying guides.

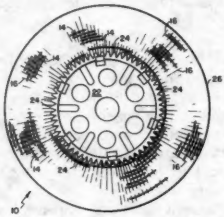


4,611,362

BUFFING WHEEL

Harold C. Sinclair, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 1, 1985, Ser. No. 718,503
Int. Cl.[4] B24D *13/04*
U.S. Cl. 15—230.15 **5 Claims**



1. A buffing wheel having a central base portion and outer buffing portion supported on said base portion, said buffing portion comprising a plurality of strips of weft inserted, warp knit fabric superimposed on one another, said superimposed fabrics being folded lengthwise with the fold abutting the base portion and the fabric on either side of the fold arranged edgewise with respect to the base portion, said fabric having chain stitch wales extending in the peripheral direction, said wales holding the weft inserted yarns in a radial direction from said central base portion.

4,611,363

SQUEEGEE HOLDING APPARATUS

Soren Samuelsson, 74-259 Candlewood St., Palm Desert, Calif. 92260

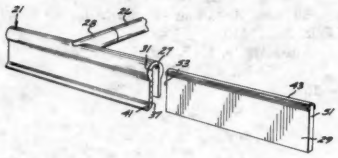
Filed May 13, 1985, Ser. No. 732,931
Int. Cl.[4] A47L *1/06*
U.S. Cl. 15—245 **10 Claims**

1. A squeegee holding apparatus comprising:

an elongated, rigid, channel-shaped holder formed with spaced-apart, first and second parallel sidewalls cooperating to define therebetween an interior cavity, said first sidewall terminating in an elongated lip and being formed on its interior with a plurality of laterally spaced apart, parallel grooves co-extensive with said lip;

a flexible squeegee blade formed with oppositely disposed first and second edges;

a removable channel-shaped cap for slidable receipt within said cavity and formed with laterally spaced-apart walls for embracing said first edge of said blade; and



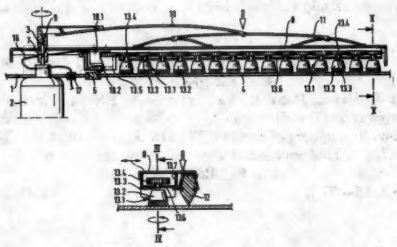
a slider positioned on the exterior of said cap and formed for selective, slidable receipt in said grooves and cooperating with said cap to removably hold said blade in said holder whereby said cap may be selectively inserted in said cavity with said slider received in selected ones of said grooves, thereby varying the distance said second edge of said blade projects beyond said lip.

4,611,364

WINDSHIELD WIPER FOR LAND, SEA AND MARINE VEHICLES, IN PARTICULAR FOR TRUCKS (LORRIES) AND PASSENGER AUTOMOBILES

Kurt Grübner, Birkenhainer Str., D-6464 Linsengericht-Waldrode, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,404
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414181
Int. Cl.[4] B60S *1/34*
U.S. Cl. 15—250.22 **3 Claims**



1. In a pivoted windshield wiper for land, air and marine vehicles, for use with curved windshields, having a predetermined sweeping angle up to maximally about 180 degrees, comprising a wiper motor adapted for reversing the direction of the motor rotation at each end position of the sweep of the wiper, a driving motor stub shaft, a wiper lever adapted for being slewed down, from the windshield and connected with said motor stub shaft, a wiping arm, and at least one wiping blade borne by said wiping arm, the improvement comprising: a spring-clip combination connecting said wiping arm with said wiper lever said wiping arm including a separate motor and a plurality of plate brush units mounted thereon, said plate brush units being drivingly connected to said separate motor for driving said plate brush units in constant rotation.

4,611,365

VACUUM CLEANER

Takashi Komatsu, Yokaichi, and Yasuo Ishino, Tsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

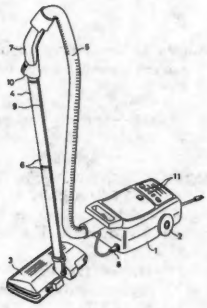
PCT No. PCT/JP84/00038, § 371 Date Oct. 10, 1984, § 102(e) Date Oct. 10, 1984, PCT Pub. No. WO84/03031, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 10, 1984, Ser. No. 667,476

Claims priority, application Japan, Feb. 12, 1983, 58-21913; Feb. 12, 1983, 58-21914; Feb. 12, 1983, 58-21915

Int. Cl.[4] A47L *9/28*

U.S. Cl. 15—339 7 Claims



1. A vacuum cleaner comprising:
a motor fan suction unit including a suction motor;
a floor brush unit including a brush motor;
a suction passage for establishing communication between said motor fan suction unit and said floor brush unit;
a pair of current carrying conductor wires for connecting said brush motor to a source of alternating current;
a remote control unit provided on said suction passage and coupled to said conductor wires so that the alternating current flows therethrough, said remote control unit having means for generating a control signal; and
circuit means coupled through said conductor wires to said remote control unit for controlling the rotational speed of said suction motor in response to the generated control signal.

4,611,366

TREATMENT OF FIBROUS MATERIALS

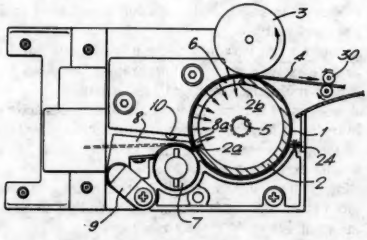
Alan Parker, Bolton, England, assignor to Hollingsworth (U.K.) Ltd., Accrington, England

Filed Jul. 20, 1984, Ser. No. 632,764

Claims priority, application United Kingdom, Jul. 25, 1983, 8319928

Int. Cl.[4] D01H *5/00*

U.S. Cl. 19—236 20 Claims



1. A process for treating staple fibre material comprising subjecting a sliver of the staple fibre material to sliding friction contact with foraminous surface means and thereby effecting elongation of the sliver, while generating an air current through the foraminous surface means to pass through the sliver being elongated and stroked by the foraminous surface means.

4,611,367

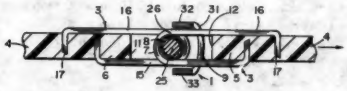
HOOK KEEPER FOR BELT LACINGS

John H. Meulenberg, Jenison, and Roy A. McKeage, Grand Rapids, both of Mich., assignors to Clipper Belt Lacer Company, Grand Rapids, Mich.

Filed Jun. 21, 1985, Ser. No. 747,166

Int. Cl.[4] F16G *3/02*

U.S. Cl. 24—33 P 51 Claims



1. In a belt lacing of the type having a plurality of hooks with legs positioned to be clenched in leading and trailing ends of a belt, and loops meshed together with a connecting pin extending therethrough; the improvement comprising:
at least one hook keeper for reinforcing at least one outermost hook in said lacing; said hook keeper comprising:
a rigid body;
at least first and second slots extending completely through said body, and being positioned in a generally side-by-side relationship therein; said first and second slots being shaped to closely receive an associated one of said hooks therethrough;
said hook keeper body being positioned between said connecting pin and the end of the belt in which said outermost hook is clenched, with the legs of said outermost hook closely received in said first keeper slot, and the legs of a second one of said hooks closely received in said second keeper slot, whereby forces acting on said outermost hook are transmitted to and resisted at least partially by said second hook to improve the strength and longevity of said lacing.

4,611,368

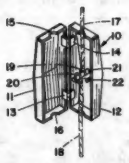
DECORATIVE AND PROTECTIVE JEWELRY CHAIN GUARD

Norma Battersby, 7386 Eagle Mills Rd., Waite Hill, Ohio 44094

Filed Mar. 27, 1985, Ser. No. 716,813

Int. Cl.[4] F16G *15/00*

U.S. Cl. 24—116 R 11 Claims



1. A protective guard for the ends of a chain of jewelry or the like comprising:
a first shell member;
a second shell member which is adapted to mate with said first shell member to form a casing having a cavity therein, the ends of an associated chain of jewelry being positionable in said casing;
a pair of apertures, one formed at each end of said casing,

said apertures being sized so that at least sections of said chain can extend therethrough;

an anchor pin secured to one of said shell members and projecting from the middle thereof into said cavity, said pin being suitably sized so that both end links of said associated chain member can be looped over said pin; and,

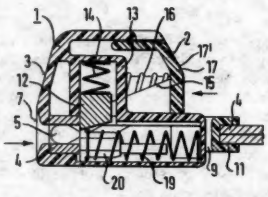
a connection means for selectively securing said first and second shell members to each other in a closed position, said connection means enabling said shell members to be selectively moved relative to each other to an open position to provide access to said end links of said associated chain member.

4,611,369

BELT LOCK FOR A SAFETY BELT

Franz Wier, Goggingen, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,107
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—642 **3 Claims**



1. A buckle assembly for receiving a tongue to interconnect two sections of a safety belt system, said buckle assembly comprising a housing having an inlet opening into which the tongue is inserted, means for connecting said housing with one of the sections of the safety belt system, a latch member supported for movement relative to said housing in a direction transverse to the direction of insertion of the tongue into said housing, said latch member being movable between an engaged condition in which said latch member is effective to block withdrawal of the tongue from said housing and a disengaged condition in which said latch member is ineffective to block withdrawal of the tongue from said housing, and manually movable pushbutton means slidably mounted on said housing for moving said latch member from the engaged condition toward the disengaged condition in response to manual movement of said pushbutton means in a direction toward said inlet opening and opposite to the direction of insertion of the tongue into said housing, said pushbutton means including a cam surface means which is movable with said pushbutton means to apply force against said latch member in a direction transverse to the direction of insertion of the tongue into said housing.

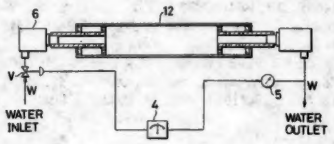
4,611,370

SINGEING APPARATUS FOR CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jun. 13, 1985, Ser. No. 744,468
Claims priority, application Japan, Jun. 13, 1984, 59-87738[U]
Int. Cl.[4] D06C *9/02*
U.S. Cl. 26—3 **1 Claim**

1. A singeing apparatus for a cloth includes a guide drum for continuously guiding the cloth to be singed and a singeing gas burner located closely opposed to the guide drum for blowing flame against the cloth guided by the guide drum, comprising means for flowing warm water through the interior of the guide drum including a valve for controlling the flow rate of the water, a device for detecting the dew-point temperature of the ambient air surrounding the guide drum and a device for detecting the temperature of the water coming out of the guide drum for determining the temperature at the surface of the guide drum whereby the temperature of the surface of the guide drum can be maintained approximately at the dew-point



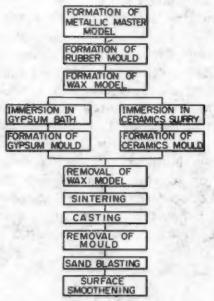
temperature of the ambient air surrounding the guide drum by controlling the amount of warm water flowing into the guide drum.

4,611,371

METHOD FOR MANUFACTURING AN EYEGLASS-FRAME

Yoshihiro Fujino, and Kazuo Kurahashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 24, 1982, Ser. No. 411,103
Claims priority, application Japan, Aug. 26, 1981, 56-133606
Int. Cl.[4] B21D *33/00*; B22C *9/02*
U.S. Cl. 29—20 **4 Claims**



1. An improved method for manufacturing an eyeglass-frame comprising the steps of:

forming a metallic master model patterned after an eyeglass-frame and having a straight pad holder extending from an associated rim;

covering said metallic master model with molten rubber in order to form a rubber female mold by separating said rubber from said metallic master model after said rubber has hardened;

injecting molten wax into said rubber female mold in order to form a wax model by separating said wax from said rubber mold after said wax has hardened;

immersing said wax model in a bath of heat-resistant material in order to form a heat-resistant material female mold;

removing said wax model from said heat-resistant material female mold by heating;

casting molten alloy into said heat-resistant material female mold to form a cast alloy having a straight section extending monolithically from a rim section;

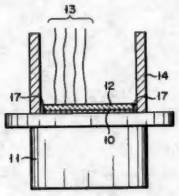
removing said cast alloy from said heat-resistant material female mold; and

bending said straight section to a required pad holder configuration.

4,611,372
METHOD FOR MANUFACTURING AN ULTRASONIC TRANSDUCER

Susumu Enjoji, and Kazufumi Ishiyama, both of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 565,174, Dec. 23, 1983, abandoned. This application Oct. 19, 1934, Ser. No. 662,626
Claims priority, application Japan, Dec. 27, 1982, 57-226974; Dec. 28, 1982, 57-227265
Int. Cl.⁴ H01L *41/22*
U.S. Cl. 29—25.35 **8 Claims**

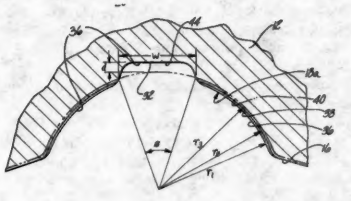


1. A method for manufacturing an ultrasonic transducer, comprising the steps of:
temporarily fixing one surface of a piezoelectric ceramic plate on a surface of a metal support;
dividing said piezoelectric ceramic plate into a plurality of annular elements by means of a cutting beam irradiated onto a surface of said piezoelectric ceramic plate opposite said one surface;
connecting a lead wire to each of said annular elements on said opposite surface of said piezoelectric ceramic plate;
fixing one end of a cylindrical case to a peripheral edge of said piezoelectric ceramic plate fixed on said metal support;
forming a body of a backing material on said opposite surface of said piezoelectric ceramic plate by casting said backing material in said cylindrical case, said lead wires extending through said cast backing material; and
removing said metal support from said annular elements.

4,611,373
METHOD OF FORMING A PRECISION BALL TRACK

Daniel W. Hazebrook, Detroit, Mich., assignor to GKN Automotive Components, Southfield, Mich.

Continuation of Ser. No. 588,514, Mar. 12, 1984. This application Nov. 22, 1985, Ser. No. 801,494
Int. Cl.⁴ B21D *53/12*; B21K *1/04, 1/05*; B23P *13/02*
U.S. Cl. 29—148.4 C **15 Claims**

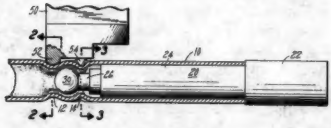


1. A method of forming a precision ball race groove track in a race member of a universal joint, said method comprising the steps of:
forming said race member with a formed ball race groove track and with a recess groove extending along said formed ball race groove track, said recess groove having a base that will not come into contact with a finishing tool used to finish machine said ball race groove track; and
finish machining said formed ball race groove track to a predetermined precision shape to produce said precision ball race groove track by moving said ball race groove track into contact with the finishing tool such that the finishing tool contacts said ball race groove track to thereby finish machine said ball race groove track without coming into contact with said base of said recess groove extending along said formed ball race groove track.

4,611,374
METHOD FOR MANUFACTURING A CHECK VALVE CONTAINED WITHIN A TUBE

Steven H. Schnelle, New Haven; Richard D. Wood, Columbia City, and Charles E. Weicht, Huntington, all of Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Division of Ser. No. 602,249, Apr. 20, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 747,623
Int. Cl.⁴ B21D *53/00, 39/00, 41/00*; B23P *15/00*
U.S. Cl. 29—157.1 R **6 Claims**

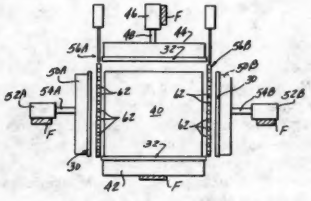


1. A method of making a check valve integral with a tube which comprises the steps of:
positioning a poppet within the tube;
crimping the tube on one side of the poppet to form a seat indentation for limiting motion of the poppet;
crimping the tube on the other side of the poppet to form a retaining projection for limiting motion of the poppet without unduly limiting flow through the tube; and
wherein the steps of crimping the tube on one side of the poppet and crimping the tube on the other side of the poppet occur substantially simultaneously with the poppet positioned within the tube.

4,611,375
APPARATUS FOR ASSEMBLING RADIATOR CORES

John J. Zapawa, Warren, Mich., assignor to Progressive Tool & Industries Co., Southfield, Mich.

Filed Jun. 10, 1985, Ser. No. 742,975
Int. Cl.⁴ B21D *53/02*; B23P *15/26, 19/00*; B23Q *3/00*
U.S. Cl. 29—157.3 C **10 Claims**



1. Apparatus for locating a plurality of like elongate first members of a uniform first width in uniformly spaced, parallel relationship with a plurality of like elongate second members of a uniform second width respectively interposed between and clampingly engaged by adjacent first members, said apparatus comprising
a support table having a pair of opposed parallel side edges spaced from each other by a distance less than the length of a first member, a pair of like aligning assemblies located adjacent to and respectively extending along said side

edges, each of said aligning assemblies comprising a guide member having an upwardly opening elongate slot therein extending parallel to the adjacent side edge of said table, a plurality of vertically projecting fingers, each including a finger base at its lower end mounted in said slot for guided sliding movement longitudinally of said slot and an upper portion projecting from the base upwardly above said guide member, lost motion link means interlinking the bases of said fingers into a chain of fingers extending longitudinally of said slot, said lost motion means accommodating movement of adjacent fingers relative to each other longitudinally of said slot between a minimum spacing wherein the upper portions of adjacent fingers are spaced from each other by a distance substantially equal to said first width and a maximum spacing wherein the upper portions of adjacent fingers are spaced from each other by a distance substantially greater than said first width, means securing the finger at one end of said chain to said guide member at one end of said slot, a reciprocable actuating means mounted on said member and coupled to the finger at the opposite end of said chain for selectively extending said chain to an extended length at which all of said fingers are at said maximum spacing from each other or for compressing said chain to a shortened length at which all of said fingers are at said minimum spacing from each other, the upper end portion of each of said fingers being of a cylindrical configuration having a diameter equal to said second uniform width and projecting upwardly above said table to receive said first members therebetween.

10. The method of assembling a radiator subassembly wherein a plurality of flat sided tubes are alternated between zigzag fins between a pair of side frame members interconnected at their opposite ends by a pair of spaced parallel header members, each of said header members having a series of uniformly spaced openings therethrough in which the ends of said tubes are seated, said method comprising the steps of:

(1) supporting a pair of said header members and a pair of said side frame members respectively along opposed sides of a horizontal rectangular assembly table,

(2) locating a plurality of said tubes on said table in spaced, generally parallel, side-by-side relationship to each other between said headers with said tubes

(a) extending generally normal to said header members

(b) with the flat sides of adjacent tubes in spaced, opposed, face-to-face relationship to each other and

(c) with adjacent tubes spaced from each other by a distacne greater than the spacing between adjacent openings in said header members,

(3) depositing a fin onto said table between each pair of adjacent tubes and between each side frame member and the adjacent tube,

(4) moving said tubes toward each other to their finally assembled spacing from each other to clamp said fins therebetween and locating said tubes in alignment with the openings in said header members, and

(5) moving said header members and side members to their finally assembled position to cause the opposed ends of said tubes to be seated in said openings in said header members, and to engage said header members with said side frame members.

4,611,376

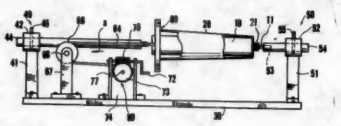
MACHINE FOR PULL-ON AND PULL-OUT OF DAMPENER COVER OF OFFSET PRINTING PRESS

Hirofumi Takeda, Osaka, Japan, assignor to MMT Inc., Osaka, Japan

Filed Apr. 22, 1985, Ser. No. 725,488
Claims priority, application Japan, Apr. 26, 1984, 59-82958
Int. Cl.[4] B29C *27/30*
U.S. Cl. 29—235 **6 Claims**

1. A machine used for operations of pull-on and pull-off of a water dampener cover to and from the rubber roller on an offset printing press essentially comprising:

roller holding means adapted to support a pair of roller support shafts by means of bushes disposed at the ends of a base plate so as to slidably move in the substantially horizontal direction but be immovably held in said bushes, each of said roller support shafts being formed with a hole into which the roller shaft can be inserted;



grasping means for grasping the one end of the water dampener cover which has been fitted over the rubber roller; and

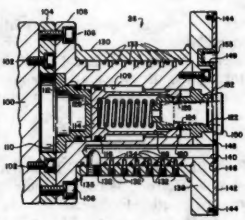
cover pulling means for pulling the thus-grasped cover along and away from the rubber roller in the axial direction of the latter.

4,611,377

INTERCHANGEABLE ROBOT END-OF-ARM TOOLING SYSTEM

Peter E. McCormick, Dallas; Rick C. Edwards, Carrollton, and Keith R. Crawford, Dallas, all of Tex., assignors to EOA Systems, Inc., Dallas, Tex.

Filed Jun. 4, 1984, Ser. No. 616,974
Int. Cl.[4] B23Q *17/00*; B23P *21/00*; B23B *39/20*
U.S. Cl. 29—407 **12 Claims**



11. A method of performing multiple tasks upon a work piece within a work cell with a robot arm and robot controller comprising the steps of:

(a) connecting a quick change adapter to the end of the robot arm;

(b) connecting a preprocessor to the robot controller and quick change adapter;

(c) placing at least two tools within the work cell;

(d) picking up a first of said two tools with said quick change adapter, thereby establishing power and intelligence communications between said tool and said preprocessor;

(e) positioning the robot arm and said first tool at a work location within the work cell by means of signals from said robot controller;

(f) performing a predetermined first task on the work piece with said first tool when located at the work location by means of signals from said preprocessor;

(g) dropping the tool in response to signals from the preprocessor indicating that the task is completed; and

(h) repeating steps (d), (e), (f) and (g) with the second of said two tools to perform a predetermined second task.

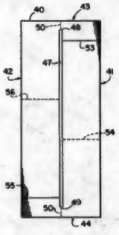
4,611,378
METHOD OF MAKING A FIBER OPTIC STRAIN SENSOR

Anthony L. Caserta, Lloyd Harbor; Russell W. Squires, Dix Hills, and Nicholas C. Szuchy, Babylon, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 451,495, Dec. 20, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,784

Int. Cl.[4] B23Q *17/00;* **B23P** *17/00;* **G01D** *11/16*

U.S. Cl. 29—407 **3 Claims**



1. A method of manufacture of a pair of tabs for a fiber optic strain sensor for mounting a pair of optical fibers of said sensor in a predetermined misalignment relative to each other, said method comprising the steps of

cutting a rectangle of material with a first pair of spaced substantially parallel length sides of predetermined length and a second pair of spaced substantially parallel width sides shorter than said length sides and substantially perpendicular thereto, said material having a substantially planar top surface and a substantially planar bottom surface substantially parallel to said top surface and spaced a predetermined thickness therefrom:

cutting a fine line through said material substantially parallel to and substantially equidistant from said length sides and extending from a first point spaced from one of said width sides to a second point spaced from the other of said width sides;

scoring a line colinear with said fine line from said first and second points to said width sides to facilitate dividing said rectangle into first and second identical halves;

forming a first trough in said top surface substantially parallel to and substantially equidistant from said width sides and extending from one of said length sides to said fine line;

forming a second trough in said top surface substantially parallel to and substantially equidistant from said width sides and extending from the other of said length sides to said fine line in misalignment with said first trough:

scoring a first pair of spaced lines substantially parallel to and spaced from said width sides and extending from said one of said length sides to said fine line to bound a tab; and

scoring a second pair of spaced lines substantially parallel to and spaced from said width sides and extending from said other of said length sides to said fine line to bound another tab.

4,611,379
METHOD OF REMOVABLY SECURING A SECURITY THREADED FASTENER APPARATUS

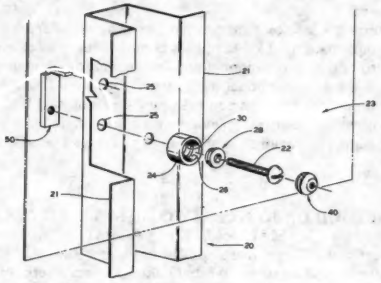
Robert L. Heitzman, Gahanna, Ohio, assignor to H&E Machine Company, Columbus, Ohio

Continuation of Ser. No. 519,067, Aug. 1, 1983, abandoned, and a continuation of Ser. No. 667,203, Nov. 1, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 790,752

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—426.5 **1 Claim**

1. A method of removably mounting a sign or other planar object to a conventional mounting bracket or post in a secure disposition resisting unauthorized removal using standard implements comprising the steps of inserting a conventional threaded bolt having an enlarged head and an elongate threaded shank through a central bore of a generally cylindrical cap member wherein the head of said bolt is disposed below the upper rim of said cap member and against a retaining lip provided near the opposing end of said central bore and the end portion of the threaded shank extends beyond said cap member; inserting the end portion of said threaded shank through a hole provided in said sign and a hole provided in a mounting bracket adapted to support said sign; aligning a nut member with the end of said threaded shank with said nut member being fixed against rotation and rotating said enlarged



head to thread said shank into and through said nut member to a position drawing said head portion in tight force-transmitting engagement with said inner lip portion of said cap member; placing a plug member having a vertically centrally disposed threaded bore with a diameter of approximately one-fourth or less of the diameter of said enlarged head of said bolt into said central bore of said cap member in force-fit relationship therein to limit access to said enlarged head; and remove said plug from said cap by rotatably inserting a threaded tool into said threaded bore and against said enlarged head to force said plug out of said central bore without rendering said bolt, said cap member or said plug unusable for similar re-use.

4,611,380
ASSEMBLY LINE MANUFACTURING CONTROL APPARATUS

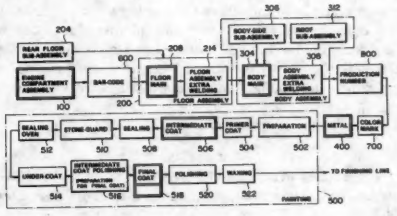
Kazuyoshi Abe; Masahiko Kawasaki; Kazuhiko Yazaki, and Yoshitada Sekine, all of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1983, Ser. No. 564,927

Claims priority, application Japan, Dec. 28, 1982, 57-232978

Int. Cl.[4] B21D *39/03*

U.S. Cl. 29—430 **45 Claims**



1. A control system for an industrial manufacturing process for manufacturing products to be assembled from a plurality of components, comprising:

first means for obtaining information and instructions related to each of the products to be manufactured according to a predetermined production plan and for generating electri-

cal signals representative of the obtained information and instructions at predetermined time intervals;

second means, responsive to said electrical signals from said first means, for converting each of the electrical signals into a bar-code pattern and encoding the bar-code pattern in a blank label, said bar-code pattern comprising a combination of first slots having a first width and second slots having a second width different from said first width, and said first and second slots being arranged to represent the contents of said electrical signal;

third means for attaching said encoded label to a base component to which other components are to be assembled; and

fourth means for reading said bar-code and for obtaining information which identifies components to be assembled to said base component and for obtaining instructions for controlling manufacturing process operations, said fourth means producing a control signal based on said label, said control signal being indicative of said identified components and required manufacturing process operations.

4,611,381

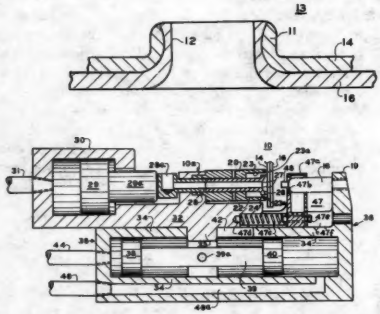
METHOD OF JOINING TWO OR MORE PIECES OF MALLEABLE MATERIAL

Robert L. La Barge, Ben Avon Borough, and Ronald J. Ewing, Allegheny Township, Westmoreland County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 21, 1984, Ser. No. 684,694

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—432 **15 Claims**



1. A method of joining together two or more pieces of malleable material comprising placing faying surfaces of the pieces in intimate contact with each other and forming headless integral inner and outer cylindrical flanges having open ends from all of the pieces at the same time by continuously drawing material of the pieces located between a pressure plate and a convex face of a draw punch to form inner and outer cylindrical tubular flanges having open ends and contacting surfaces flared outwardly toward the open ends thereof locking the inner and outer flanges together against axial displacement.

4,611,382

METHOD FOR MANUFACTURING A FISTULA

Julie L. Clark, Livingston, N.J., assignor to Joule' Inc., Orange, N.J.

Filed Apr. 23, 1984, Ser. No. 602,685

Int. Cl.[4] B23P *11/02*; B29C *47/00*; A61M *5/32*

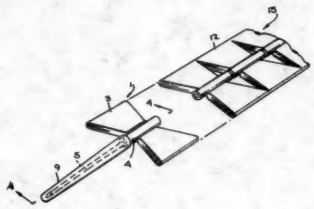
U.S. Cl. 29—450 **4 Claims**

1. A method of manufacturing a fistula comprising the steps of:

extruding a plastic strip of indeterminate length having a pre-determined cross section with spaced flaring wing-like portions extending outwardly from a hollow core portion;

blanking the endmost portion of said strip for defining individual flared wing-like members in said wing-like portions extending outwardly from said core portion;

inserting a hollow core needle into said plastic core portion with the inserted end of said needle being positioned at a rearwardmost portion of the blanked wing-like member;



placing a hollow molded guard member over said needle with said guard frictionally engaging an end portion of said core portion;

cutting said blanked endmost portion free from the remainder of said extruded plastic strip thereby forming a completed fistula with taper wing portions and a succeeding forward wing portion.

4,611,383

TOOL HOLDER FOR MACHINE TOOLS

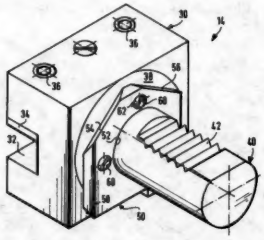
Werner Sonnek, Lichtenwald, Fed. Rep. of Germany, assignor to Traub GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,369

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320693

Int. Cl.[4] B23G *3/157*

U.S. Cl. 29—568 **6 Claims**



1. A tool holder adapted to be attached to a turret of a machine tool having associated thereto gripper means which include at least one gripper for automatically exchanging tool holders, said tool holder comprising:

a tool holder head which includes fastening means for a tool at one side and a planar abutment face at another side of said tool holder head, and

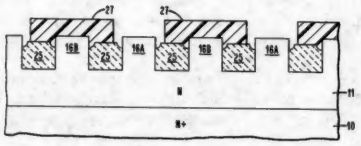
a substantially cylindrical tool holder shaft extending at right angles away from the abutment face and adapted to be clamped in a receiving bore of said turret, wherein a gripper plate is arranged adjacent the abutment face so as to surround said substantially cylindrical tool holder shaft, said gripper plate having a first and a second gripping face inclined with respect to each other, and at the opposite side of the tool holder shaft the gripper plate comprising a third gripping face inclined with respect to the first and second gripping faces.

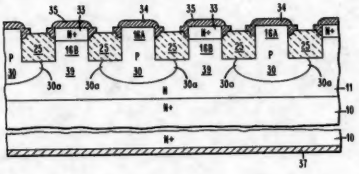
4,611,384

METHOD OF MAKING JUNCTION FIELD EFFECT TRANSISTOR OF STATIC INDUCTION TYPE

Izak Bencuya, and Adrian I. Cogan, both of San Jose, Calif., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 30, 1985, Ser. No. 729,025
Int. Cl.[4] H01L *21/265, 21/38, 21/425*
U.S. Cl. 29—571 8 Claims





1. The method of fabricating a junction field effect transistor comprising

providing a body of semiconductor material including a first layer of semiconductor material of one conductivity type of relatively high resistivity and a second layer of semiconductor material of the one conductivity type of relatively low resistivity contiguous with said first layer, said first layer having a surface at a surface of the body;

forming a layer of a first protective material adherent to said surface;

forming a plurality of parallel grooves through said layer of first protective material and into said first layer of semiconductor material producing interposed ridges of semiconductor material, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and having a bottom, alternate ridges being gate ridges and intervening ridges between the gate ridges being source ridges;

forming layers of said first protective material adherent to the side walls of said grooves;

treating the body of semiconductor material to form a layer of a second protective material which is nonconductive at the bottom of each of said grooves;

removing said first protective material from said body;

introducing conductivity type imparting material of the opposite conductivity type into the gate ridges of semiconductor material at said surface to convert zones of said first layer of semiconductor material to said opposite conductivity type thereby forming gate regions of the opposite conductivity type, each of said gate regions including the associated gate ridge and having portions extending laterally beneath the bottoms of the adjacent grooves toward the laterally extending portions associated with adjacent gate ridges to produce channel regions of the one conductivity type of relatively high resistivity therebetween;

introducing conductivity type imparting material of the one conductivity type into the source ridges of semiconductor material at said surface to produce a source region of the one conductivity type of relatively low resistivity in a zone adjacent to the surface in each of said source ridges; and

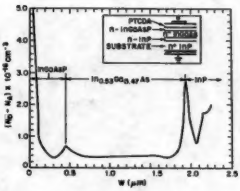
applying conductive material to form electrical contacts in ohmic contact with said source and gate regions at the surfaces of said source and gate ridges, respectively.

4,611,385

DEVICES FORMED UTILIZING ORGANIC MATERIALS

Stephen R. Forrest, Chatham; Martin L. Kaplan, Morris Plains, and Paul H. Schmidt, Chatham, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 389,909, Jun. 18, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,700
Int. Cl.[4] H01L *21/66, 29/28*
U.S. Cl. 29—574 10 Claims



1. A process for forming a plurality of devices comprising the steps of choosing during said formation a semiconductor region of a representative device of said plurality, measuring at least one property of said region, and completing the formation of all or some of said plurality if said property is satisfactory characterized in that

said property is measured by depleting a semiconductor region of said device by applying an electric field across an interface formed by a semiconductor portion of said device and a material chosen from the group consisting of 1,8-naphthalic anhydride, 3,4,9,10-perylenetetracarboxylic dianhydride, 1,4,5,8-naphthalenetetracarboxylic dianhydride, imides and diimides of 3,4,9,10-perylenetetracarboxylic dianhydride, and imides and diimides of 1,4,5,8-naphthalenetetracarboxylic dianhydride.

4,611,386

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Hiroshi Goto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 564,713
Claims priority, application Japan, Dec. 27, 1982, 57-228400
Int. Cl.[4] H01L *21/76, 21/308*
U.S. Cl. 29—576 W 17 Claims

1. A method of producing a semiconductor device having a semiconductor substrate, comprising the steps of:

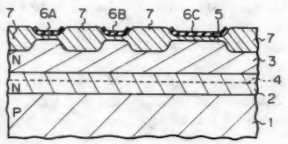
(a) forming a buried layer in the semiconductor substrate;

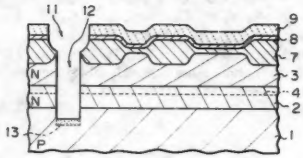
(b) forming an epitaxial layer on the semiconductor substrate;

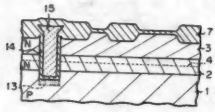
(c) selectively oxidizing the epitaxial layer, except portions in which an isolation region and active regions are to be formed, to form a field oxide film;

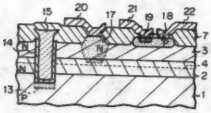
(d) forming, after said oxidizing step, a groove extending through the epitaxial layer and the buried layer in the portion in which the isolation region is to be formed, a side

wall of the groove being aligned with an edge of the oxide film;









(e) covering the surface of the groove with an insulating film; and

(f) filling the groove with a filler material.

4,611,387

PROCESS FOR PRODUCING NPN TYPE LATERAL TRANSISTORS

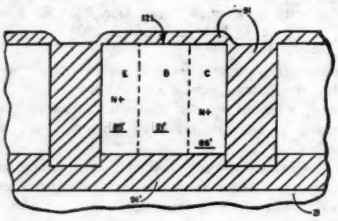
Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 558,071, Dec. 5, 1983, which is a continuation-in-part of Ser. No. 239,748, Mar. 2, 1981. This application Apr. 8, 1985, Ser. No. 721,004

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] H01L *21/461*

U.S. Cl. 29—576 W **5 Claims**



1. A method for forming an array of NPN-type lateral transistors in a silicon substrate doped P-type, wherein each transistor is formed comprising the following steps:

masking the substrate to outline a pair of boundary regions for each semi-array including therein a plurality of active regions to become transistors;

slotting the substrate in said boundary regions to a given depth;

etching away the substrate via said slots sufficiently to separate the semi-arrays of active regions from the substrate except at spaced apart supporting locations therealong;

oxidizing the substrate and semi-arrays to at least substantially completely oxidize the peripheries of the semi-arrays;

slotting the substrate orthogonally to the first mentioned slots to provide second slots with orthogonal pairs of slots defining individual transistor active regions for the respective transistors;

doping the regions defined by orthogonal pairs of slots N+ via corresponding edges of the second slots and driving in the N+ doping until the width of the N+ doped driven-in dimensions respectively exceed 1 micron; and,

establishing electrical connections to the outer N+ regions, and inner P region of the substrate doped P-type.

4,611,388

METHOD OF FORMING AN INDIUM PHOSPHIDE-BORON PHOSPHIDE HETEROJUNCTION BIPOLAR TRANSISTOR

Krishna P. Pande, Columbia, Md., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 484,762, Apr. 14, 1983, Pat. No. 4,529,996. This application Apr. 15, 1985, Ser. No. 723,423

Int. Cl.[4] H01L *21/20, 21/265*

U.S. Cl. 29—576 E **13 Claims**

1. A method for forming a bipolar heterojunction indium phosphide transistor comprising the steps of:

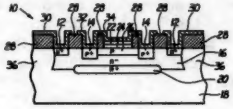
epitaxially growing a buried n+ indium phosphide layer on a selectively etched semi-insulating indium phosphide substrate;

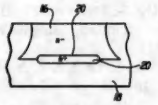
epitaxially growing an n− type indium phosphide collector layer over said buried n+ layer;

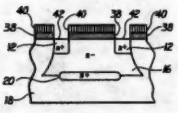
implanting silicon ions into said collector layer to form an n+ collector contact region about the perimeter of said collector layer;

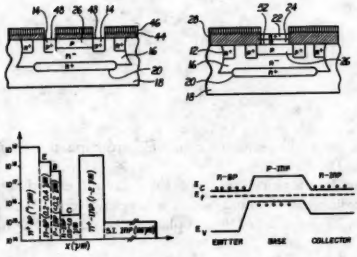
implanting metal ions into the central region of said collector layer to form a p− type base region and a p+ base contact region;

epitaxially growing an n− type boron phosphide layer over said base region to form an emitter; and









epitaxially growing an n+ type boron phosphide layer over said emitter to form an emitter contact region.

4,611,389

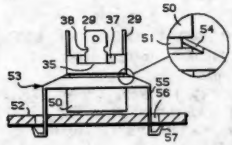
LOW-COST POWER DEVICE PACKAGE WITH QUICK-CONNECT TERMINALS AND ELECTRICALLY ISOLATED MOUNTING MEANS

Kelvin R. Blair; Lynn C. Furman, both of Tempe, and David M. Knott, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 549,211, Nov. 3, 1983, Pat. No. 4,530,003, which is a continuation of Ser. No. 230,466, Feb. 2, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 712,833

Int. Cl.⁴ H01L *23/34, 23/48, 23/28*

U.S. Cl. 29—589 **11 Claims**



1. A process for the fabrication of a semiconductor device package with integral heat spreader, quick-connect terminals, insulated body, and utilizing prepackaged devices, comprising the steps of:

connecting electrical leads of a prepackaged device having an exposed heat spreader to a lead frame having quick-connect terminals to provide an assembly;

forming said assembly into a predetermined shape;

positioning said assembly in a mold cavity such that said heat spreader rests in a depression of predetermined depth in a first surface of said mold cavity and is substantially coplanar with said first surface, and such that a plastic encapsulant is substantially prevented from penetrating between said heat spreader and said mold cavity;

introducing said plastic encapsulant into said mold cavity around said assembly to provide an insulating body and insulating attachment means to facilitate attachment of said body to a mounting surface.

4,611,390

METHOD OF MANUFACTURING SUPERCONDUCTING COMPOUND STRANDED CABLE

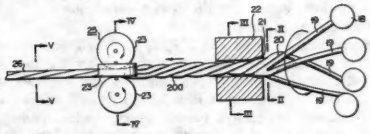
Yasuzo Tanaka, Yokohama, and Yoshio Furuto, Kanagawa, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan.

Continuation of Ser. No. 8,263, Feb. 1, 1979, abandoned, which is a continuation of Ser. No. 746,250, Dec. 1, 1976, abandoned. This application Oct. 5, 1981, Ser. No. 308,558

Claims priority, application Japan, Dec. 3, 1975, 50-142889; Dec. 18, 1975, 50-150976; Feb. 10, 1976, 51-13535; Apr. 10, 1976, 51-40601; Apr. 28, 1976, 51-49058; May 14, 1976, 51-54965; May 17, 1976, 51-56370; May 18, 1976, 51-56986

Int. Cl.⁴ H01L *39/24*

U.S. Cl. 29—599 **43 Claims**



1. A method for the production of a superconducting compound cable which comprises the steps of:

(a) stranding a plurality of strands to provide a stranded assembly having a hollow portion along and inside the stranded assembly, at least one of said strands including a component capable of forming a superconducting compound in the form of filament by a diffusion heat treatment,

(b) reducing the cross section of the stranded assembly by drawing said stranded assembly through a drawing dies to such a reduction rate that the arciform length in cross section of two interfaces formed by contact between one strand and two adjacent strands falls within the range of 20% to 70% of the perimeter of the strand,

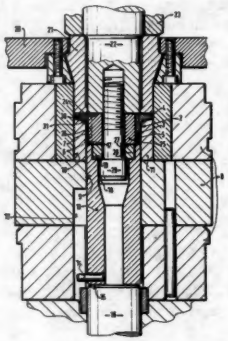
(c) with a flattening device shaping the reduced stranded assembly to eliminate the hollow portion previously provided therein and to cause said assembly to have a quadrilateral shape in cross section to such a reduction rate that the total cross-sectional area of all the strands accounts for more than 50% of that of a quadrilateral circumscribed about the periphery of said assembly, and

(d) heating the shaped assembly at a temperature at which a superconducting compound material is formed in the strands.

4,611,391
COMMUTATOR RING MANUFACTURING METHOD AND APPARATUS

Peter Franz, Diekholzen, and Werner Ross, Hildesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,984
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242702
Int. Cl.[4] H01R *43/06*
U.S. Cl. 29—597 4 Claims



1. A method of making a commutator ring having a tubular portion (3) that defines an outer tubular diameter, inner ribs (5) that define anchoring means, and a flange (4) that defines an outer flange diameter, said method comprising the steps of:

providing a ring-shaped blank (1) defining an outer ring diameter and an inner opening;

introducing said blank (1) into a receiving section (10) of a forming apparatus, said forming apparatus having:

a matrix (11) including an inner wall that is shaped to form an outer surface of the commutator ring (2);

a ring-shaped die (21);

a composite upper die (22,25) that is inserted into the ring-shaped die, said composite upper die including a die punch (22) that has a punching end surface (24), and a rib-forming upper die (25,28) having outer surfaces that are shaped to form said inner ribs (5), having a first die punch end face engagement surface, and having a second engagement end face (19,27) that is remote from the first die punch end face engagement surface;

a holding screw (29) passing through the rib-forming upper die (25,28) and into the die punch (22), and separably fastening the die punch (22) onto the upper die (25,28) while leaving at least a portion of the second engagement end face (19,27) exposed; and

a lower punch element (13) that is inserted into the matrix (11);

applying the ring-shaped die (21) against a face of the blank (1);

introducing the lower punch element (13) into the matrix and at least up to the blank;

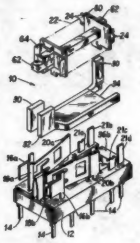
introducing the rib-forming upper die (25,28) into the inner opening of the ring-shaped blank (1), and directly positioning the lower punch element with counter pressure against said at least portion of the second engagement end face (19,27); then

moving the rib-forming upper die (25,28) into the inner opening of the ring-shaped blank (1) and penetrating the rib-forming upper die into engagement with said blank, thereby forming the inner ribs, and thereby cold flowing the metal of the blank between the matrix and an outer surface of the rib-forming upper die (25,28), while continually applying counter pressure by the lower punch element (13) against said at least portion of the second engagement end face (19,27), thereby moving the lower punch element (13) while the lower punch element continually applies counter pressure against said at least portion, which thereby controls flow of the metal of the blank around the rib-forming upper die within the matrix and prevents formation of flashing between the die punch (22) and the rib-forming upper die (25) and thereby forming a segmental ring.

4,611,392
METHOD OF MANUFACTURING RELAYS

Richard E. Bell, Princeton, Ind., assignor to Potter & Brumfield, Inc., Princeton, Ind.

Filed Feb. 5, 1985, Ser. No. 698,301
Int. Cl.[4] H01H *11/00*
U.S. Cl. 29—602 R 4 Claims



1. A method of manufacturing electromagnetic relays, comprising the steps

providing a plurality of contact leads and electrically interconnected terminal pins in a given pattern,

providing a mass of thermoplastic electrical insulating material,

molding the plurality of leads and pins in their given pattern into a base member of said thermoplastic insulating material and molding a recessed portion into one surface of the base member, said recessed portion being adapted to loosely receive a relay magnet structure that includes at least two pole pieces,

inserting a magnet structure with pole pieces to fit loosely in said recessed portion in the base,

at a first plurality of locations along the periphery of said recessed portion, and adjacent the magnet structure, reforming the thermoplastic material against the sides of the magnet structure to thereby tightly bind the magnet structure in a desired aligned position in said base, and

at a second plurality of locations at the periphery of the recessed portion, and adjacent the magnet structure, reforming the thermoplastic material of the base to form flaps that extend over the magnet structure to prevent withdrawal of the magnet structure from the recessed portion of the base.

4,611,393
PROCESS FOR PRODUCING A DOT PRINTER HEAD

Takashi Norigoe, Ohhito, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

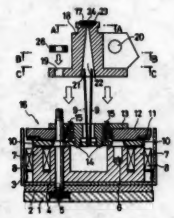
Filed Sep. 12, 1985, Ser. No. 775,395
Claims priority, application Japan, Sep. 13, 1984, 59-192040
Int. Cl.[4] B41J *3/12*; H01F *7/06*
U.S. Cl. 29—602 R 5 Claims

1. A process for producing a dot printer head, comprising:

an inserting step wherein a plurality of needles are inserted at once into a tapered hole formed in a guide holder and tapered toward an end thereof, said needles each having a rear end thereof secured to a corresponding one of a plurality of armatures which are opposed to and form a

magnet block together with a yoke and a plurality of radially arranged cores, said needles having gradually increasing entire lengths toward opposite ends of a straight line along which forward ends of said needles are aligned;

a guide holder assembling step wherein said needles are inserted one after another beginning with the longest outermost ones thereof into a plurality of needle holes in said needle guide which are provided forwardly of said



guide holder and are chamfered at entrances thereof for holding said needles without any interference therebetween while inner ones of said needles are each inserted into the corresponding needle hole under the guidance of a guide face provided by an inner face of an outer needle adjacent thereto and then said guide holder is secured to said magnet block; and

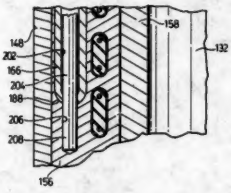
a finishing step wherein said needles which extend in different lengths from said guide holder are machined in a plane parallel to a front face of said needle guide.

4,611,394

METHOD OF MANUFACTURE OF AN INJECTION MOLDING INTEGRAL HEATED PROBE

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)

Continuation-in-part of Ser. No. 453,572, Dec. 27, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,286
Claims priority, application Canada, Dec. 17, 1982, 417995
Int. Cl.[4] H05B *3/00*
U.S. Cl. 29—611 **19 Claims**



1. A method of manufacturing an injection molding melt conveying nozzle probe having an elongated outer member, an electrical heater member which extends longitudinally in the outer member and is at least partially surrounded by a highly conductive material to transfer heat uniformly to the melt, and a sleeve adapted to removably receive a thermocouple extending longitudinally adjacent the heater member, comprising the steps of:

(a) forming the outer member of a suitable corrosion resistant material with a rear end and a forward end, the outer member enclosing a longitudinally extending space therein;

(b) locating a sleeve having a thermocouple receiving bore in the outer member, the sleeve extending longitudinally from an open rear end adjacent the rear end of the outer member to a closed forward end adjacent said space near the forward end of the outer member;

(c) inserting the electrical heater member into said space to extend longitudinally adjacent the thermocouple receiving sleeve;

(d) sealing the joints around said space in the outer member;

(e) vacuum casting highly conductive material into said space in the outer member to surround at least a portion of the heater member and the forward end of the thermocouple receiving sleeve and form an integral structure; and

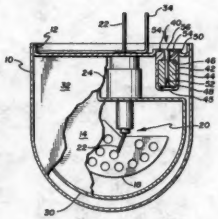
(f) drilling through the closed forward end of the thermocouple receiving sleeve to extend the thermocouple receiving bore further into the highly conductive material, whereby the thermocouple can be accurately located in the highly conductive material near the forward end of the outer member.

4,611,395

FILLING SYSTEM FOR HERMETICALLY SEALED BATTERIES

Gary M. Phillips, Vadnis Heights, and Albert S. Benjamin, White Bear Lake, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 579,787, Feb. 13, 1984, Pat. No. 4,542,080. This application May 6, 1985, Ser. No. 730,568
Int. Cl.[4] H01M *6/00*
U.S. Cl. 29—623.2 **3 Claims**



1. A method of introducing a fluid component into a cell container, comprising:

providing a filler opening having a polymeric body positioned therein, the body having a relatively small diameter opening extending therethrough and leading into the container interior;

introducing a tight fitting needle-like conduit through the opening in the polymeric body and into the container interior;

exerting a vacuum on the conduit to substantially evacuate the container;

connecting a supply of the fluid component to the conduit and allowing the vacuum established in the container to draw a predetermined amount thereof into the container;

removing the needle-like conduit from the polymeric body;

force-fitting a metal insert into the opening in the polymeric body to seal it closed, and

attaching the outer portion of the metal insert to the container to fix it in its sealing position in the polymeric body.

4,611,396

FUEL CELL PLATE SEPARATOR

Louis A. Joó , Johnson City; Kenneth W. Tucker, Elizabethton, and Jay R. Shaner, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, Briarcliff Manor, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,419
Int. Cl.[4] H01M *6/00*
U.S. Cl. 29—623.5 **15 Claims**

1. A process for the production of a porous monolithic

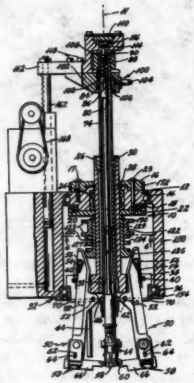
graphite electrode for a fuel cell having an integral edge seal comprising the impregnation of a porous filter paper substrate having a thickness of from 0.5 to 5 mm with a low coke yield impregnant, curing said impregnated electrode from 2 to 24 hours in air at 150° C. to 300° C., baking said electrode in a 4 to 24 hour cycle rising to 500° C. to 1100° C., impregnating said electrode on the edges only with a medium to high coke yield impregnant, repeating said curing and baking steps, and graphitizing said electrode to 1800° C. to 3000° C. in a cycle of 4 hours to 4 days.

4,611,397

PICK AND PLACE METHOD AND APPARATUS FOR HANDLING ELECTRICAL COMPONENTS

Stanley W. Janisiewicz, Endwell, and Edward J. Lovell, Binghamton, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,827
Int. Cl.[4] H05K *3/30*; B23P *19/00*
U.S. Cl. 29—834 **10 Claims**



1. In a method of handling electrical components comprising picking up an electrical component by vacuum at the tip of a nozzle and placing said component onto a selected position of a substrate with a placement pressure, the improvement comprising the steps of:

sensing and monitoring pressure experienced by said component during said placing; and

limiting said placement pressure automatically to a preselected amount.

3. In an apparatus for effecting an electrical component handling method comprising picking up an electrical component by vacuum at the tip of a nozzle and placing said component onto a selected position of a substrate with a placement pressure, the improvement comprising:

means, operatively associated with said nozzle, for sensing and monitoring pressure experienced by said component during said placing;

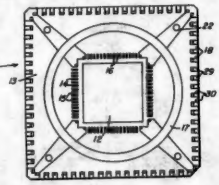
means, operatively associated with said sensing means, for limiting said placement pressure to a preselected amount in response to said sensing and according to a controller.

4,611,398

INTEGRATED CIRCUIT PACKAGE

Robert J. Eames, Warren, Pa., and Richard E. Johnson, Jamestown, N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 659,212
Int. Cl.[4] H05K *3/30, 1/18*
U.S. Cl. 29—841 **3 Claims**



1. A cover for an integrated circuit package, said cover comprising: and electrically insulating body having an outer surface and an inner surface; said inner surface having a substantially centrally located quadrangular depression therein; and an annular groove formed in said inner surface and circumscribing said depression, said annular groove having a minimum diameter greater than the largest diagonal measurement of said depression; and said groove being quadrangular in cross-section.

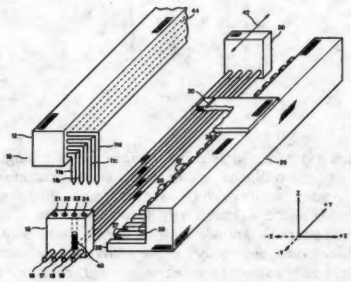
3. A method of fabricating and integrated circuit package comprising the steps of: attaching a plurality of electrically conductive lead-ins to an electrically insulating base; fixing and integrated circuit chip to said base; making electrical connections between said chip and said lead-ins; providing a insulating cover having and inner surface facing said insulating base; fixing a self-supporting, lead-in deformable sealant washer into an annular groove formed in the inner surface of the electrically insulating cover; and mounting said cover upon said base whereby said plurality of lead-ins penetrate said washer.

4,611,399

CONNECTOR PIN ALIGNMENT TOOL AND METHOD FOR ALIGNING

Antonio Tavares, and Trevor Martin, both of San Jose, Calif., assignors to Storage Technology Partners, Santa Clara, Calif.

Filed Dec. 6, 1983, Ser. No. 558,684
Int. Cl.[4] H01R *43/20*; B23P *19/00*
U.S. Cl. 29—876 **4 Claims**



1. In an electronic manufacturing assembly process wherein an electrical connector has a multiplicity of protruding leads arranged in an orderly array, but wherein the detached end of each said lead is free to move some amount from its position in said array, and wherein said leads must be inserted into a multiplicity of fixed holes which are positioned in a pattern

corresponding to said array as part of said assembly process, a tool for aligning and constraining said leads to remain aligned with said array positions while said leads are inserted into said holes, said tool comprising:

a plurality of guide rails having their first ends attached to a fixed block, said guide rails fitting between said leads in a first direction, thereby aligning said leads in said first direction when said guide rails are inserted between said leads;

a comb having a multiplicity of teeth, said teeth fitting between said leads in a second direction below and in contact with said guide rails, thereby aligning said leads in said first and second directions when said guide rails and said teeth are inserted between said leads; and

clamping means for holding said guide rails and said teeth in their respective inserted positions while said leads are startably inserted into their respective holes.

4. A method for quickly and easily aligning the pins or leads of a connector with a set of sockets or holes of a mating member without causing damage to said pins or leads, the pens or leads of said connector comprising protruding leads that are arranged in an orderly array, the detached ends of said leads being free to move in order to allow each to be aligned with its respective mating socket or hole, said method comprising the steps of:

(a) constraining the movement of the detached end of said leads in a first direction by inserting spaced-apart parallel guide rails in between the leads of said array;

(b) constraining the movement of the detached end of said leads in a second direction that is substantially orthogonal to said first direction by inserting spaced-apart parallel teeth in between the leads of said array;

(c) partially inserting the constrained leads of the first connector in the sockets of the second connector;

(d) removing the constraints imposed by steps (a) and (b); and

(e) fully inserting the leads of the connector in the holes or sockets of the mating member.

4,611,400

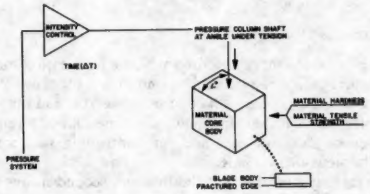
BLADE AND PROCESS OF MAKING SAME

Anthony F. Drake, P.O. Box 31192, Santa Barbara, Calif. 93130-1192

Division of Ser. No. 388,547, Jun. 15, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,810

Int. Cl.⁴ C03B *33/02*

U.S. Cl. 30—353 **9 Claims**



1. Process of fracturing a glass blade, said process comprising:

a. securing a core of glass, crystalline, non-crystalline or composite material;

b. positioning an edge of said core of said material at a predetermined angle to a pressure shaft;

c. forcing said pressure shaft against said core at a predetermined pressure, at a predetermined velocity, at said predetermined angle over a time interval; and

d. increasing said force initiating fracture of a blade body whereby said blade includes a fractured edge thereby providing a smooth and sharp cutting edge.

8. Blade with at least two fractured edges by the process of claim 1.

4,611,401

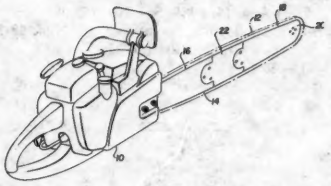
CHAIN SAW GUIDE BAR EXTENSION

Michael N. Piller, 3270 I St., Washougal, Wash. 98671

Filed Nov. 14, 1984, Ser. No. 671,245

Int. Cl.⁴ B23D *57/02*

U.S. Cl. 30—387 **11 Claims**



1. In a chain saw including a cutting chain adapted to travel around a guide bar and being coupled to and driven by a drive unit, the combination comprising:

an elongated multiple section guide bar whose periphery is convexly curved, at least in part, and comprised of rear and forward coplanar guide bar portions each having a peripheral cutting chain track, with the rear end of said rear portion being attachable to the drive unit; and

a coplanar guide bar extension member of predetermined length located intermediate said rear and forward guide bar portion for varying the working length of said guide bar, said extension member having matching height dimensions with the rear and forward guide bar portions at the points of junction therewith and having upper and lower peripheral cutting chain tracks joining the tracks of said rear and forward guide bar portion to provide a coextensively continuous cutting chain track.

4,611,402

DIGITAL TAPE MEASURE

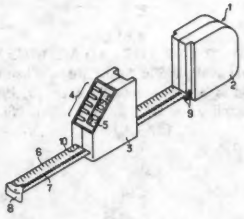
Nobuyuki Yamamoto, and Tatsuaki Nakai, both of Kyoto, Japan, assignors to Kyoto Measuring Instruments Corp., Kyoto, Japan

Filed Oct. 31, 1985, Ser. No. 793,659

Claims priority, application Japan, Jan. 18, 1985, 60-008100

Int. Cl.⁴ G01B *3/10*

U.S. Cl. 33—139 **1 Claim**



1. A digital tape measure comprising a tape stored in a case body when it is not used and drawn out of the case body through an aperture thereof to be movable corresponding to a length of an object to be measured when it is used and on the surface of which detection marks for length measurement are affixed, detecting means for detecting said detection marks on the tape, computing means for computing a detection signal outputted from the detecting means corresponding to an amount of movement of the tape, and displaying means for displaying a result of computation obtained by the computing

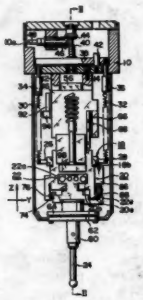
means, characterized by dividing the case body into a housing for storing the tape and a housing for holding a measuring part in which said detecting means, computing means and displaying means are fitted and through which said tape passes, said housings being detachably connected each other.

4,611,403

SURFACE TRACER

Hideo Morita; Kenji Abiko, and Tetsuo Nakamura, all of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,953
Claims priority, application Japan, Aug. 18, 1984, 59-172143
Int. Cl.[4] G01B *3/22*
U.S. Cl. 33—169 R **1 Claim**



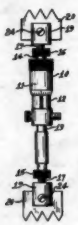
1. A surface tracer comprising a base, X-, Y- and Z-axis sliders supported on said base to be slidable perpendicular to each other, and a probe rigidly connected with said X-axis slider and adapted to contact the surface of a work, the profile of said surface being detected as electrical signals when said probe slides on the surface of said work, said tracer being characterized by suspending spring means for suspending all of said sliders from said base and return spring means for providing a returning force to return said X- and Y-axis sliders to their original positions with respect to said base, said return spring means having one end rigidly connected with said X-axis slider carrying said probe, the other end of said return spring means being supported slidably relative to said base in its longitudinal axis direction, and sliding faces between each of said sliders receive pressurized air to form an air bearing therebetween.

4,611,404

CALIPER FOR THREAD MEASUREMENT

Ronald G. Arsenault, 10506 Ashby Rd., Jacksonville, Fla. 32218

Continuation of Ser. No. 566,906, Dec. 29, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 810,507
Int. Cl.[4] G01B *3/38, 3/40*
U.S. Cl. 33—199 R **22 Claims**



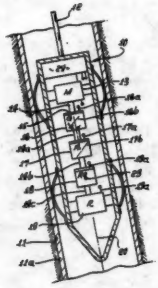
1. In a caliper having a body of at least two cooperating members relatively movable with respect to each other to cause the distance between said members to be longer or shorter along a linear lengthwise measurement axis; the improvement which comprises a combination structure attached to each said member in axial alignment, each said structure including a support means for attachment to said member at a desired extension therefrom, a releasable clamping means connected at the end of said support means, each said support means including an element having opposing side walls, and a substantially rectangular planar tip having one elongated edge portion releasably clampable to each said clamping means and having an opposite free edge of a selected screw threaded profile contour having multiple roots and crests on each and appropriate to the thread contour of the object being measured by the caliper, said one edge portion including a stepped groove engaged with respective said side walls of said element for preventing movement in the plane of said planar member between its opposite side edges, one of said planar tips having a thread profile which intersects said axis at the root of the thread and the other of said planar tips having a thread profile which intersects said axis at the crest of the thread.

4,611,405

HIGH SPEED WELL SURVEYING

Donald H. Van Steenwyk, San Marino, Calif., assignor to Applied Technologies Associates, San Marino, Calif.

Continuation-in-part of Ser. No. 293,159, Aug. 17, 1981, Pat. No. 4,468,863. This application Jul. 30, 1984, Ser. No. 635,612
The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.
Int. Cl.[4] G01C *9/00*
U.S. Cl. 33—304 **14 Claims**



1. In a borehole survey method which employs first means for measuring angular rate, and second means for sensing tilt, said first and second means having sensitive axes and outputs, and a rotary drive for said first and second means, and circuitry for processing said outputs and for controlling said rotary drive, the steps that include:

(a) operating the drive and the first and second means at a first location in the borehole, and also operating said circuitry, to produce signals used to determine the azimuthal direction of tilt of the borehole at such location,

(b) then traveling the first and second means and the drive lengthwise of the borehole away from the location, and operating the drive and at least one of the first and second menas during such traveling and also operating said circuitry, to produce signals used to determine changes in borehole alignment during traveling,

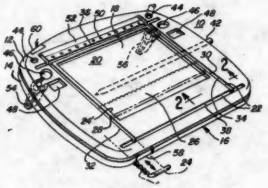
(c) and maintaining at least one of said sensitive axes at a predetermined orientation relative to horizontal during said travel,

(d) said borehole alignment comprising borehole tilt from vertical and azimuthal direction of tilt.

4,611,406
ENCLOSURE FOR ELECTRICAL DATA INPUT APPARATUS

Keith A. Engstrom, So. Barrington, and Bjarne Frederiksen, Melrose Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 31, 1984, Ser. No. 615,864
Int. Cl.[4] B43L *13/00*
U.S. Cl. 33—443 1 Claim



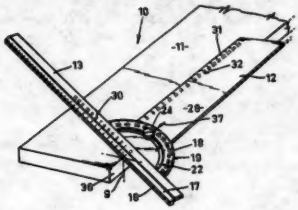
1. An enclosure for an electrical data input apparatus comprising a top section and a bottom section; said top section and said bottom section being assemblable to form case means for encasing said apparatus; said top section providing an operational access to said apparatus and providing scribing guide means for cooperation with a scribing alignment means for facilitating recordation of substantially geometrically true inputs upon said apparatus; said scribing alignment means being separable from said case means; said scribing alignment means and said scribing guide means cooperating to effect orientation of said scribing alignment means in a plurality of axes with respect to said case means; said scribing alignment means being removably storable within said case means; said enclosure further comprising recordation means, said recordation means being cooperable with said scribing alignment means and said scribing guide means to record said substantially geometrically true inputs upon said apparatus; said recordation means being removably storable within said case means; said removable storage of said scribing alignment means being provided by a first cavity in said case means, said first cavity having therein latching means for retention of said scribing alignment means within said first cavity; said latching means being operable from outside said case means to effect release of said scribing alignment means from said first cavity; and said removable storage of said recordation means being provided by a second cavity in said case means, said second cavity having therein binding means for frictionally removably retaining said recordation means within said second cavity; said removable storage of said scribing alignment means and said recordation means providing a temporarily unitary assembly of said enclosure, said scribing alignment means, and said recordation means while maintaining said operational access to said apparatus unimpeded.

4,611,407
PIVOT ASSEMBLY

Keith N. van Gorp, 28 Avery Court, Greenbank, Queensland 4124, Australia

PCT No. PCT/AU84/00009, § 371 Date Sep. 4, 1984, § 102(e) Date Sep. 4, 1984, PCT Pub. No. WO84/02754, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 13, 1984, Ser. No. 648,157
Claims priority, application Australia, Jan. 13, 1983, PF7586
Int. Cl.[4] B43L *7/06*
U.S. Cl. 33—471 11 Claims

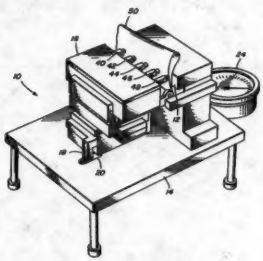
1. A guide or marking tool comprising a stock assembly and a blade assembly, the latter having an intermediate mounting segment connected pivotally to one end of said stock assembly for pivotal movement about a pivot axis and being provided with angle markings whereby its rotational position about said pivot axis may be monitored and a guiding or marking blade supported by said intermediate mounting segment for movement therewith and arranged with its guiding or marking edge coincident with said pivot axis and said stock assembly having an abutment face disposed in a plane containing said pivot axis whereby it may be engaged against a reference edge of a workpiece so as to position the guiding or marking blade on the workpiece for pivotal movement thereacross about its pivot axis supported at a selected position on said reference edge.



4,611,408
MECHANICAL AVERAGING GAUGE

Robert A. Plante, Erving, Mass., assignor to The L. S. Starrett Company, Athol, Mass.

Filed Oct. 3, 1985, Ser. No. 783,579
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—552 5 Claims



1. Gauge apparatus for averaging displacements at a plurality of locations along the surface of an object from a reference surface comprising:

a base member supporting the reference surface;

a measuring unit mounted on the base member for linear motion perpendicular to the reference surface and means for biasing the measuring unit toward the reference surface; and

means arranged to indicate the displacement of the measuring unit from the reference surface;

the measuring unit comprising:

a plurality of probes extending from the measuring unit toward the reference surface and perpendicular to the reference surface;

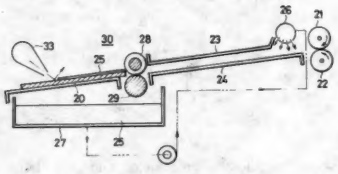
the measuring unit including a plurality of first and second sliding members, each of the first sliding members being in contact with a rear portion of one of the probes and the second sliding members being in contact with two adjacent ones of the first sliding members.

4,611,409

LIQUID REMOVING METHOD

Akira Minami; Sho Nakao, and Takao Nakayama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1984, Ser. No. 620,583
Int. Cl.[4] F26B 5/14
U.S. Cl. 34—9 2 Claims



1. A method for removing liquid (25) from an upper surface of a planar plate (20), comprising the steps of: conveying said plate downwardly at an angle θ inclined approximately 5° to a horizontal, removing a larger part of said liquid from the surface of said plate with first liquid removing means (30) having a solid surface adjacent to the surface of said plate; and removing liquid remaining on the surface of said plate by second liquid removing means comprising an air knife (33);

wherein said first liquid removing means comprises a pair of rollers (28, 29), said plate passing through a nip formed between said rollers;

wherein a first one of said rollers comprises two end parts (31) and an intermediate part (32) between said two end parts, said two end parts having a larger diameter than said intermediate part, and the other one of said rollers comprises a straight roller of substantially identical length as said first one of said rollers;

wherein said end parts of said first one of said rollers engage opposite margin portions of said upper surface of the planar plate; and

wherein said air knife is separate from said pair of rollers, functions independently thereof, and is spaced substantially downstream therefrom in the direction of conveyance.

4,611,410

APPARATUS FOR THE HEAT TREATMENT OF SYNTHETIC YARN

Maximilian Brossmer, Hanau, Fed. Rep. of Germany, assignor to D.I.E.N.E.S. Apparatebau GmbH, Müilheim and Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, both of, Fed. Rep. of Germany

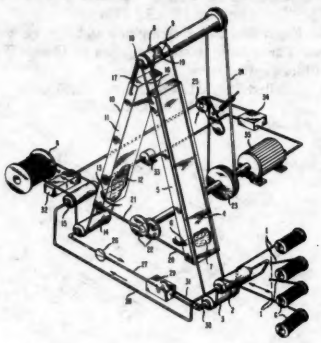
Filed Mar. 27, 1984, Ser. No. 593,918
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311777
Int. Cl.[4] F26B 3/22
U.S. Cl. 34—41 16 Claims

1. An apparatus for the heat treatment of synthetic yarns comprising

a yarn supply source;

at least one curved heating surface receiving yarn from the yarn supply source and provided such that the length over which the yarn engages the heating surface can be changed;

an axis disposed in parallel to a tangental plane of the surface of said heating surface and where the heating surface can tilt around this axis for varying the length of contact between heating surface and yarn such that in case of a larger speed a longer length of contact can be provided; and



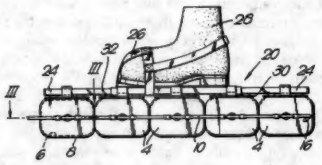
an actuator for tilting the heating surface depending on the speed of the yarn.

4,611,411

DEVICE FOR REDUCING THE DANGER OF ACCIDENTAL DETONATION OF A LAND MINE

Shlomo Ringler, 9 Zvi Segal St., Ashkelon, and Itzhak Chavet, Keren Kayemet St. 3, Rehovot, both of Israel

Filed Aug. 6, 1985, Ser. No. 762,890
Int. Cl.[4] A43B 3/12, 7/32
U.S. Cl. 36—7.5 9 Claims

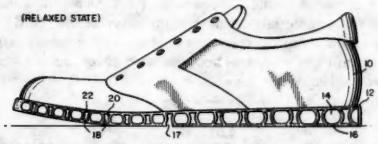


1. A mine-field shoe for reducing the danger of accidental detonation of a land mine by a wearer of the shoe, comprising an inflatable multi-compartment air cushion having, when inflated, at least one flexible subsantially flat ground-contacting surface that extends across a plurality of said compartments, at least one rigid tread member attachable to an upper surface of said air cushion for evenly distributing a wearer's weight along said air cushion and across the tops of said plurality of compartments, and means for attaching said mine-field shoe to a wearer's boot, each of the compartments of said air cushion being in communication with at least one other of said compartments so as to prevent any significant increase in the internal pressure of any one of said compartments resulting from a decrease in the internal volume of said one compartment, thereby to allow deformation of said ground-contacting surface to form a matching counterpart of the terrain that is engaged by said shoe while maintaining a substantially even distribution of the load on said shoe along the entire ground-contacting surface of said air cushion.

4,611,412
SHOE SOLE WITH DEFLECTIVE MID-SOLE

Eli Cohen, 350 Continental Ave., Paramus, N.J. 07652

Continuation-in-part of Ser. No. 548,614, Nov. 4, 1983, Pat. No. 4,536,974. This application Oct. 17, 1984, Ser. No. 661,708
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] A43B *13/18, 7/08*
U.S. Cl. 36—28 7 Claims

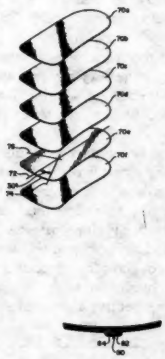


1. A sole component for a shoe comprising:
an inner sole provided directly underneath the shoe;
a mid-sole provided directly underneath said inner sole, said mid-sole provided with a plurality of pairs of parallel ribs each of said pairs of ribs provided with first and second ribs, said first rib of one of said pairs of ribs provided with at least one portion angled with respect to said inner sole, and said second rib of said one of said pairs of ribs provided with at least one portion angled with respect to said inner sole and angled oppositely from said angled portion of said first rib, each of said pairs of ribs initially spaced from adjacent pairs of ribs such that when a force is applied normal to said shoe, each of said ribs freely deflects until each of said first ribs of said pairs of ribs intrudes upon a second rib of an adjacent pair of said ribs, at which point said ribs begin to compress; and
an outer sole provided directly underneath said mid-sole.

4,611,413
REINFORCED ORTHOTIC INSERT

Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratories, Inc., Blaine, Wash.

Filed Apr. 3, 1985, Ser. No. 719,413
Int. Cl.[4] A43B *13/38, 13/41*
U.S. Cl. 36—44 7 Claims



1. A substantially unitary orthotic insert adapted to be placed in an article of footwear, said insert having a longitudinal axis parallel to a lengthwise axis of a foot for which the insert is used, and a transverse axis, said insert comprising:
a. a rear portion adapted to underlie and engage a plantar surface of a calcaneal area of the foot;
b. a forward portion adapted to underlie and engage a plantar surface of a metatarsal head area of the foot;
c. an intermediate portion connecting to and extending between said rear and forward portions to engage a plantar surface of a mid-foot area of the foot;
d. said insert having outside and inside edge portions adapted to be positioned adjacent an outside edge and an inside edge of the foot, respectively;
e. an elongate reinforcing member having a reinforcing axis along a lengthwise dimension of said reinforcing member, said reinforcing member being rigidly mounted to said insert so as to resist bending moments along, and transmit applied forces along, said reinforcing axis, said reinforcing member comprising:
1. a central elongate core portion extending along said reinforcing axis;
2. a plurality of elongate fibers having a substantial alignment component parallel to said reinforcing axis, with said fibers being positioned around said core portion in a generally tubular configuration;
f. said reinforcing member being positioned at a localized area of said insert.

4,611,414
SKIBOOT

Raimund W. Vogel, Lierstr. 25, D 8 Munich 19, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 506,095
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3226969; Feb. 21, 1983, 3305930
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—120 20 Claims

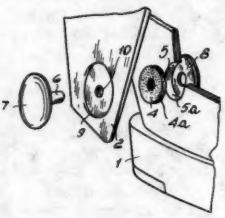
1. A ski boot comprising a hard shell for taking up the foot, a cuff for gripping the lower leg and forming said boot cuff, said cuff being pivotally joined at hinge points to said hard shell and having prolongations running past said hinge points towards a sole of said hard shell, resilient compressive means placed in a back part of said sole, said prolongations being joined with said means for producing resistance to forward bending of said leg, said resistance increasing with forward bending, wherein said compressive means consists of at least one compression resilient element made of cellular resilient material, said resilient compression element being placed in a take-up space in a back part of said sole of said hard shell, that a slide is placed in front of at least one said compression element for the transmission of compressive force thereto, said prolongations being in the form of laterally stiff levers with lower ends thereof joined to said slide functionally, said levers having upper ends joined with a stiff cuff.

4,611,415

DEVICE FOR ADJUSTING FLEX IN SKI BOOTS AND THE LIKE

Valerio Tonel, Crocetta Del Montello, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jul. 16, 1984, Ser. No. 631,361
Claims priority, application Italy, Jul. 21, 1983, 22449/83[U]
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—120 5 Claims



1. In a ski boot, or the like, having a shell portion, at least one quarter and hinge means for hingedly connecting said quarter to said shell portion thereby to render said quarter tiltable with respect to said shell portion about an axis transverse to the longitudinal extension of the ski boot,

a device for adjusting the flex of the ski boot, the device comprising as components parts of said hinge means:

means defining a seat in said shell around said axis, an elastic element arranged within said seat, said elastic element having a bore normally coaxial with said axis and an outward peripheral surface the width of which extends in the direction of said axis and in bearing relationship with said seat,

a pivot pin extending through said bore of said elastic element and secured to said quarter, thereby the hinged connection and supporting of said quarter onto said shell portion occurring through interposition of said elastic element between said pin and said seat.

4,611,416

ATHLETIC SHOE WITH DISPLAY PORTION AND METHOD OF MAKING

Danny Lin, 132 Duane St., New York, N.Y. 10013

Filed Mar. 29, 1984, Ser. No. 594,653
Int. Cl.[4] A43B 23/24; G09F 3/18
U.S. Cl. 36—136 2 Claims

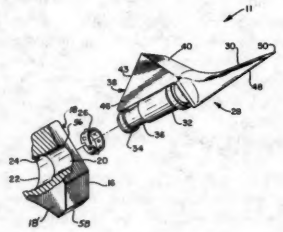
1. An athletic shoe or the like having a quarter portion extending forwardly and on either side of the longitudinal center line of said shoe, dividing an upper central eyestay opening, outer material overlying the said quarter portion, said outer material forming eyestay portions on either side of said eyestay opening, said outer material also forming a saddle portion extending integrally from said eyestay portion toward the sole of said shoe, means stitching said outer material to said quarter along the periphery of said outer material, along the edges of said opening and along the forward, rearward and lowermost edges thereof, access means at an upper portion of said outer material below one of said eyestay portions providing access to the space between said outer material and said quarter, said outer material being formed with a window display opening spaced from said access means and wherein indicia display means are inserted between said outer material and said quarter behind said window display opening, a transparent window is interposed between said display means and said window display opening and is stitched to said outer material, said indicia display means comprises a card, said stitching means forming a pocket area between said quarter and said outer material, the peripheral edges of said card substantially conforming to the size and shape of the inner peripheral boundaries of said poocket area, said access means being provided with closure means.

4,611,417

NON-ROTATABLE TOOTH FOR A CYLINDRICAL SOCKET BORE

John H. Carlson, Rte. 2, Box 400, Odessa, Tex. 79764

Filed Mar. 5, 1984, Ser. No. 586,439
Int. Cl.[4] E02F 9/28
U.S. Cl. 37—141 T 13 Claims



1. An improved non-rotatable, dirt type excavating tooth in combination with a support pocket having a cylindrical bore for receiving a rotatable type prior art bit;

said excavating tooth includes a cylindrical shank at the rear end thereof and a ground engaging blade at the forward end thereof, said shank being made complementary respective to the support pocket bore so that said shank can be telescopingly received in a captured manner within said bore of said pocket, thereby removably mounting said excavating tooth respective to the pocket;

said excavating tooth includes a relatively flat ground engaging blade at the forward end thereof; a shield assembly, means attaching said shield assembly at a medial portion defined by the area where the shank is joined to the blade;

said shield assembly includes a divider wall which upwardly and rearwardly extends respective to said medial portion, spaced sidewalls which extend from said medial portion and are attached to and extend downwardly and rearwardly from said divider wall and receive opposed external sides of the support pocket therewithin, the opposed external sides of the support pocket abuttingly engage the sidewalls and prevent axial rotation of said dirt type excavating tooth respective to a pocket for receiving a rotatable type bit.

4,611,418

LOCKING MECHANISM FOR EARTH EXCAVATION TEETH

Richard L. Launder, 8107 San Lucas Dr., Whittier, Calif. 90605

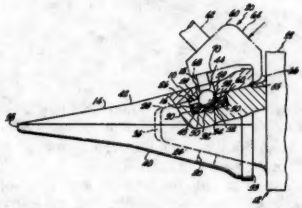
Filed Mar. 28, 1985, Ser. No. 716,967
Int. Cl.[4] E02F 9/28
U.S. Cl. 37—141 T 11 Claims

1. A locking assembly for releasably securing earth excava-

tion points on the bucket of a trenching machine, said assembly comprising:

a nose piece adapted to be secured to the bucket of a trenching machine and defining an extension having tapered side walls, converging upper and lower surfaces and an open cylindrical chamber recessed in said extension, the central axis of said chamber being perpendicular with respect to the lower surface of said extension;

an excavation point defining converging upper and lower surfaces, a digging edge at the forward end thereof and a cavity at the rearward end thereof, said cavity being adapted to receive said extension of said nose piece and defining upper and lower converging wall portions adapted to abut and mate with said upper and lower converging surfaces on said extension of said nose piece, said



lower wall portion having an aperture extending perpendicularly therethrough and communicating with said cavity, said aperture defining a radius less than the radius of said chamber in said nose piece, and upon said cavity receiving said extension, said aperture communicates with said chamber in said nose piece; and

a locking means disposed within said chamber, said means comprising a resilient deformable biasing member disposed within said chamber, said member being encased in a flexible sealing material, and a locking member carried by said resilient biasing member extending from said chamber into said aperture in said point and abutting said point about the perimeter of said aperture to retain said point on said nose piece, at least a portion of said locking member defining a transverse dimension greater than the radius of said aperture.

4,611,419

TROUSER PRESS

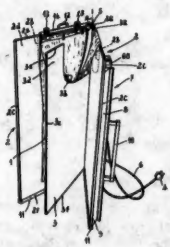
Patrice Duplessy, 18, rue du Prieurie, Ecully, and Hervé Duplessy, Le Val Saint Germain, St. Cheron, both of France

Filed Mar. 4, 1985, Ser. No. 707,875

Claims priority, application France, Mar. 6, 1984, 84 03783; Nov. 20, 1984, 84 17832

Int. Cl.[4] D06F *72/29*

U.S. Cl. 38—21 **11 Claims**



1. A trouser press comprising:

a pair of similar elongated boards each having a pair of generally parallel, vertical, and longitudinal edges and upper and lower transverse edges bridging same;

a heating plate similar to and between the boards and having respective such longitudinal and transverse edges, the plate being formed at the respective upper edge with a cutout, whereby a pair of trousers can be positioned with one trouser leg on one side of the plate, one trouser leg on the other, the trouser waistband generally at the upper edges, and the trouser crotch at the cutout;

means for heating the plate;

hinge means attaching the boards and plate together in registration with the heating plate sandwiched between the boards for pivoting of each of the boards relative to the plate along one of the plate edges and the corresponding board edge;

means including grippers at the upper edges for securing the trouser waistband of the trouser in the press; and

further means including clips generally at the lower edges for securing the legs in the press, said further means including a pair of guides extending along one of the upper transverse edges and at least three such grippers slidable transversely therealong with at least one of the grippers offset transversely from another of the grippers, whereby at least both of the front creases can be held by respective grippers and the rear of the trousers by another gripper.

4,611,420

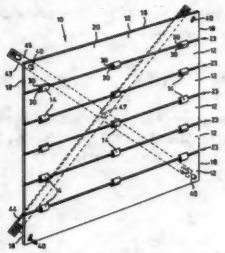
SIGN CONSTRUCTION

Peter A. Delamere, 227 Balmoral Avenue, Toronto, Ontario, M4V 1K1, Canada

Filed Feb. 19, 1985, Ser. No. 702,802

Int. Cl.[4] G09F *15/00*

U.S. Cl. 40—610 **8 Claims**



1. A road sign comprising:

a plurality of panel members, each having two long edges, two short edges and two opposed faces, the panel members being aligned so that a long edge of one is adjacent a long edge of another, such adjacent long edges constituting a hinge line between the respective panel members,

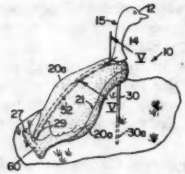
each hinge line having at least two spaced-apart hinge members, each hinge member being a cylindrical collar having two ends and a split running from one end to the other,

each hinge member being engaged through slots in the respective panel members, the slots being inwardly adjacent the respective long edges, each pair of adjacent panel members being hinged only to each other,

each of the two outermost panel members having an aperture adjacent each end,

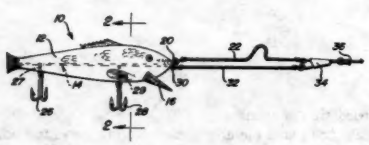
a supporting X-frame having two crossed elongate frame members joined together at the middle, each frame member having adjacent its two ends a means for engaging one of said apertures, whereby the panel members are maintained in opened-out taut condition.

4,611,421
SUPPORT FOR GOOSE DECOY
Steven R. Jacob, Rte. 3, Sebeka, Minn. 56477
Filed Nov. 18, 1985, Ser. No. 798,826
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 12 Claims



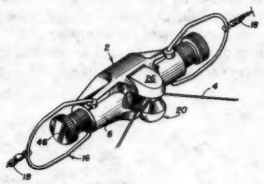
1. A decoy comprising:
a head portion;
a neck portion secured to said head portion;
a body portion including a hoop member and a flexible bag of wind sock construction having an opening at a front end with said bag secured to said hoop member with said hoop member maintaining said opening in an open condition;
a spike for insertion into the ground;
a hoop support means for rotatably connecting said hoop to said spike for rotation about a generally vertical axis of rotation;
means for connecting said head and said neck portion to said hoop support means;
a bag support means rotatably connected to said hoop support means for rotation about a generally vertical axis of rotation with said bag support means extending into said bag and engaging an upper portion of said bag in spaced relation from a lower portion of said bag.

4,611,422
FISHING LURE WITH SEPARABLE BODY AND HOOK TRACK
Douglas R. Hampton, Rte. #1, Box 422, Firth, Id. 83236
Filed Aug. 20, 1984, Ser. No. 642,515
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.36 8 Claims



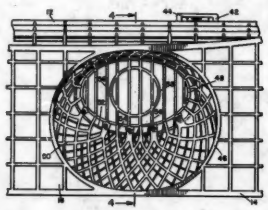
1. A fishing lure comprising a body member for attracting fish, a hook track with at least one hook, means for releasably securing the hook track to the body member, and first and second connector means for independently connecting the hook track and body member respectively to the end of a fishing line for breaking away of the first connector means from the line in preference to the second connector means in the event of the hook being snagged, and tension being applied to the fishing line, whereby the hook and track tends to break away from the fishing line in preference to the body member and separate from the body member allowing the body member to be recovered, wherein the securing means comprises means for providing a sliding connection between the body member and the hook track, wherein the means providing a sliding connection comprises a longitudinal profiled guideway formed along the body member for slidingly receiving the hook track, and wherein the guideway and hook track are of complementary T-shaped cross section, the hook track including at least one hook depending from the upright of the T.

4,611,423
OUTRIGGER CLIPS
Herbert E. Rupp, 4761 Anchor Ave., Port Salerno, Fla. 33492
Filed Sep. 26, 1985, Ser. No. 780,040
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—43.12 14 Claims



1. An outrigger clip for releasably holding a fishing line in trolling position astern a fishing boat comprising:
an elongated body having a blind longitudinal bore extending through each end thereof,
fastener means on each of said body ends for supporting said outrigger clip outboard of said boat on outrigger lines,
roller means over which said fishing line may freely run for holding said line in trolling position, and
tension means for controlling the releasing of said holding of said fishing line,
said roller means comprising:
a gate portion having a hinged end and an unhinged end,
said hinged end being pivoted on the midsection of said body about an pivot axis substantially parallel to the longitudinal axis of said body to permit said roller means to swing between a fishing line holding position and a fishing line release position,
a shaft extending from an outboard end of said gate portion normal to said pivot axis,
a V-shaped roller rotatably retained on said shaft and
a lug extending from the same side of said gate portion as said shaft at an acute angle relative to said gate portion and said shaft.

4,611,424
SELECTABLE ENTRY SHELLFISH TRAP
John L. Tarantino, 4396 Arcadia Dr., San Diego, Calif. 92106
Filed Dec. 12, 1984, Ser. No. 680,771
Int. Cl.[4] A01K *69/08*
U.S. Cl. 43—100 4 Claims



1. A selectable entry shellfish trap, comprising:
a cage-like enclosure having elliptically shaped top and bottom members and a peripheral side wall extending therebetween;
a pair of substantially oppositely positioned entry passages extending from said side wall toward the center of said enclosure;

each of said passages having an entrance port formed in said side wall, and an exit port within said enclosure;

a peripheral structure extending between said entrance port and exit port of each passage for providing a continuous transitting surface for shellfish;

means for selecting the size of said exit port according to the average size of shellfish to be caught, comprising an outer ring defining a first exit port size, an inner ring coplanar with the outer ring defining a smaller exit port size, and spaced support members extending across said exit port to support said inner ring, said support members comprising cuttable means for selectively cutting out and removing said inner ring to increase said exit port size;

means removably mountable on said structure adjacent said exit port opening for preventing the escape of shellfish from said passage; and

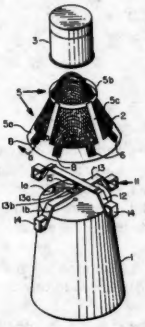
means mountable between said top and bottom members substantially opposite said exit ports for holding bait.

4,611,425

BOLL WEEVIL TRAP

Willard A. Dickerson, Raleigh, N.C., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 16, 1985, Ser. No. 734,647
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—121 **20 Claims**



1. An apparatus for capturing weevils wherein an inverted wire mesh funnel, which is open at its apex and circular mouth, is mounted on a base member, the base member having an inner peripheral wall and a top, wherein an annular space is defined between the inside of said mouth and the outside of said base member to permit entry of weevils through said annular space, wherein a capture chamber is mounted on said funnel so that said apex substantially extends into said capture chamber, the improvement comprising:

a. a first ring-shaped member releasably connected around said funnel mouth to maintain said circular configuration of said mouth;

b. ring retaining means releasably connected to said base member and to said first ring-shaped member to hold said ring-shaped member in place upon said base member.

4,611,426

RODENT BAIT STATION

Donald W. Willis, P.O. Box 291, Lompoc, Calif. 93436

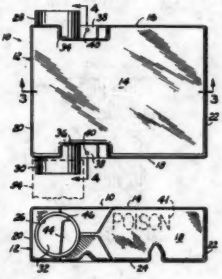
Filed Feb. 8, 1985, Ser. No. 699,763
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **3 Claims**

1. A tamper-resistant rodent bait station, comprising:

a one piece hollow housing defined by top and bottom walls joined together by opposing vertical side walls, a front end wall and a rear end wall,

said side walls each having a rodent entry opening therein disposed adjacent the front end wall in approximately axially aligned passageway forming relation;

upstanding barrier means inverted U-shaped in transverse section struck in from said bottom wall adjacent but spaced from said rear end wall and cooperating with the side walls for forming a bait compartment in said housing,



there being sufficient space between the barrier means and the housing top wall for the entry of a rodent into the bait compartment; and ,

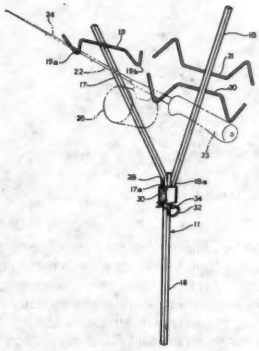
wall means including a downwardly open socket struck in from said bottom wall and forming an upstanding generally diamond-shaped in transverse section wall on said bottom wall projecting into said housing between the entry openings and bait compartment adjacent the passageway and medially the width of the housing for restricting the passageway area between the entry openings.

4,611,427

COLLAPSIBLE FISHING ROD HOLDER

Halsey Coutcher, 5377 Bayshore Rd., Oregon, Ohio 43616

Filed Oct. 1, 1984, Ser. No. 656,270
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **11 Claims**



1. A three membered fishing rod holder comprising a ground-engaging leg member and two pivotably connected arm members releasably securable to said leg member, in a first position with arm members extending upwardly and outwardly, said arm members bearing rod-supporting lateral fingers, and a second position with said arms in side-by-side relationship with said leg member; and said arm members have

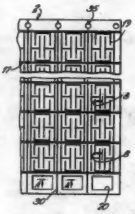
a bend in a terminal end proximate the pivot connection with said leg member.

4,611,428

METHOD AND EQUIPMENT FOR PLANTING OF BAND BALL PLANTS

Marja H. Häkli, Porvoo, Finland, assignor to Lännen Tehtaat Oy, Iso-Vimma, Finland

Filed Sep. 26, 1984, Ser. No. 654,566
Claims priority, application Finland, Sep. 26, 1983, 833469
Int. Cl.[4] A01G 9/02
U.S. Cl. 47—86 20 Claims



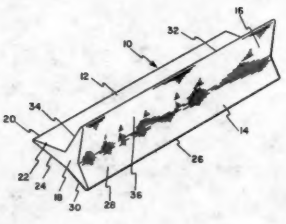
1. A device for the growing and planting of plants, comprising trough means open at one end and a multi-layered sheet covering the trough, said sheet including a decomposable layer of a size of the entire sheet and a less decomposable band-like layer facing said trough, said sheet including folded portions which are positioned in said trough so as to extend across said trough and have a shape and size substantially conforming with the cross-section of the trough, whereby balls of growth substrate may be formed between adjacent folded portions.

4,611,429

DOOR SEALING WEDGE

David E. Kanies, 815 N. Humboldt St., #401, San Mateo, Calif. 94401

Filed Dec. 20, 1984, Ser. No. 684,377
Int. Cl.[4] E06B 7/00
U.S. Cl. 49—70 13 Claims



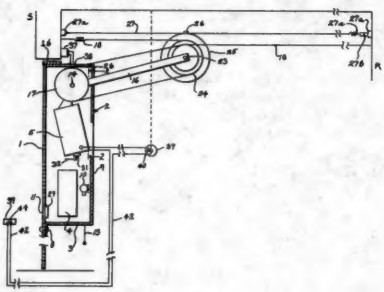
1. A resilient door sealing wedge for use in preventing leakage of a floor stripping liquid through a space between a closed door and the floor, comprising a unitary, unattached to said door, elongated body member having a horizontally extending front, rear and top projection interconnected by a central portion of said body member, said front projection having a leading end, an upper surface and a bottom surface sloping upward and rearward from said leading end toward said central portion; said rear projection having a trailing end, an upper surface and a bottom surface sloping upward and frontward from said trailing end toward said central portion; the bottom surfaces of said front and rear projections forming a continuous, adhesive-free, angular surface, the midportion thereof being detached from the floor surface; said top projection extending generally upwardly having an upper end, a front surface and a rear surface sloping downward from said upper end toward said central portion; the length of said wedge being sufficient to seal said space.

4,611,430

DOOR MOUNTED OPERATING MECHANISM FOR AN OVERHEAD DOOR

Wilhelm E. Altrogge, Lange Strasse, Postfach 1101, D 4937 Lage (Lippe), Fed. Rep. of Germany

Continuation-in-part of Ser. No. 271,976, Jun. 9, 1981, abandoned. This application Nov. 28, 1984, Ser. No. 675,816
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3021724
Int. Cl.[4] E05F 15/20
U.S. Cl. 49—199 19 Claims



1. An operating mechanism for moving a door relative to a building structure along a path of opening movement having a vertical portion and a horizontal portion extending from the front to the rear of the building, said operating mechanism being mountable adjacent the upper edge of the door and comprising:

a drive pulley (17) mounted on the door (1) for rotation about an axis (14) normal to the direction of movement of the door;

a drive motor (5) selectively coupled to said drive pulley for rotating same;

an arm (16) pivotally mounted on the door and extending therefrom generally in the direction of the opening movement of the door;

a guide pulley (24) mounted on said arm for rotation about an axis parallel to the axis of said drive pulley; and

a cable (18) mounted on the building structure along the path of movement of the door, said cable being strung in a course extending rearwardly from the front of the building structure, around said guide pulley (24), around said drive pulley (17), and returning over said guide pulley (24) to the rear of the building structure.

4,611,431

PASSAGEWAY CLOSURE OF ADJUSTABLE WIDTH

Charles W. Lauro, Akron, Ohio, assignor to Gerber Products Company, Fremont, Mich.

Filed Oct. 10, 1985, Ser. No. 786,409
Int. Cl.[4] E06B 3/68
U.S. Cl. 49—55 10 Claims

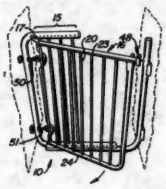
1. A closure of adjustable width for mounting across a passageway, said closure comprising:

first and second posts;

a vertical barrier extending laterally from said first post;

a gate having a hinge on a first vertical edge and a latch on

a second vertical edge adapted for engagement with said second post; and



means for securing said hinge to said vertical barrier at any of a plurality of positions along the width of said vertical barrier.

4,611,432

WINDOW, ESPECIALLY FOR INSTALLATION IN AN INCLINED ROOF

Arne Lund, Ostbirk; Egon Nowakowski, Hovedgård; Elgard Nielsen, Ostbirk, and Per G. Nielsen, Horsens, all of Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark

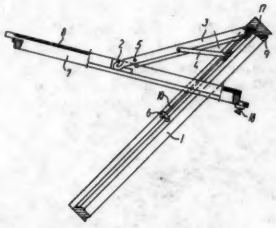
PCT No. PCT/DK84/00062, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00195, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 28, 1984, Ser. No. 702,233

Claims priority, application Denmark, Jun. 29, 1983, 2988/83

Int. Cl.[4] E05D *15/48*

U.S. Cl. 49—192 **3 Claims**



1. A tilting window assembly adapted for installation in an inclined roof comprising:

a main frame;

an intermediate frame hingedly mounted to said main frame at the top thereof;

a sash pivotally mounted in the area of its horizontal center line to said intermediate frame;

urging means to permanently urge said intermediate frame in its opening direction relative to said main frame;

associate arresting means provided on at least one of said main frame and said intermediate frame for maintaining said intermediate frame in its closed position relative to said main frame against the force of said urging means; and

a handle provided on the internal side of the window assembly and operable to release said associate arresting means in case of an emergency situation.

4,611,433

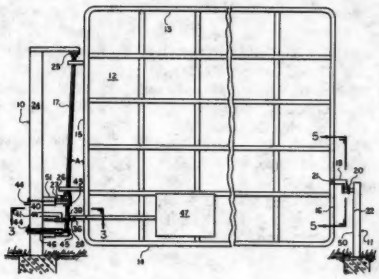
VEHICLE-OPERATED GATE

Marshall B. Heizer, Jr., Rte. 1, Box 21, Rawlings, Va. 23876

Filed Sep. 30, 1985, Ser. No. 781,799

Int. Cl.[4] E05P *7/06*

U.S. Cl. 49—242 **6 Claims**



1. Gate apparatus comprising:

(a) a gate member of horizontally elongated rectangular periphery defined by upper and lower edges and first and second vertically disposed ends, and adapted to swing horizontally between open and closed positions,

(b) a straight axle affixed to said first vertical end in substantially parallel orientation thereto within the general plane of said gate member,

(c) latching means associated with said second vertical end,

(d) a hinge post disposed adjacent and parallel to said first vertical end,

(e) upper fixed bushing means which rotatively engages the upper extremity of said axle at a fixed distance from said hinge post,

(f) lower movable bushing means which rotatively engages said axle adjacent its lower extremity and is horizontally movable with respect to said hinge post,

(g) a substantially flat cam horizontally disposed below said lower bushing means, having rearward and side edges and a forward edge comprised of two arcuate lobes symmetrically disposed about a center line running between said forward and rearward edges, said lobes meeting in a cusp disposed upon said center line, and a circular aperture centered upon said center line adjacent said rearward edge,

(h) paired ramps associated with the rearward edge of said cam beginning at sites extending beyond the side edges thereof, having flat bottoms coplanar with the lower face of the cam, and terminating in an angled portion directed toward the upper face of the cam,

(i) a cam rod attached to said hinge post in a manner to pivot in a vertical plane above said cam, and having attached to its free extremity a downwardly directed roller adapted to rotate in a horizontal plane in engagement with the edges of said cam, said roller being adapted to rest in said cusp in the closed position of said gate member,

(j) a control rod extending vertically from said lower bushing means and downwardly through the aperture in said cam,

(k) spring means extending between said hinge post and control rod, and adapted to urge said rod toward said hinge post,

(l) motion dampening means extending between said hinge post and control rod, and

(m) paired arms rigidly associated with each lobe of said cam and extending from the rearward edge thereof toward the center of each side of said gate member, whereby

(n) pressure against either arm causes the cam roller to leave the cusp and travel onto the upper face of the cam, causing the lower extremity of the axle to move away from the

hinge post, which action upwardly tilts the gate member so as to disengage it from said latching means and swing it horizontally to an open position, whereupon gravity force causes return of the gate member to its closed position, the rate of said opening and closing being controlled by the concertive action of said spring and motion dampening means.

4,611,434

SWINGABLE SLIDING DOOR FOR VEHICLES, PARTICULARLY AUTOMOTIVE VEHICLES

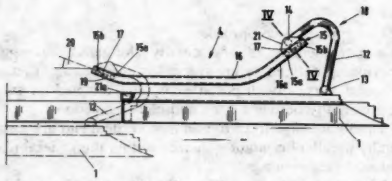
Ingo Britzke, Kassel, and Hans Kramer, Baunatal, both of Fed. Rep. of Germany, assignors to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

PCT No. PCT/DE84/00107, § 371 Date Jan. 11, 1985, § 102(e) Date Jan. 11, 1985, PCT Pub. No. WO84/04500, PCT Pub. Date Nov. 22, 1984

PCT Filed May 12, 1984, Ser. No. 690,770

Int. Cl.⁴ E05D *15/58*

U.S. Cl. 49—257 **7 Claims**



1. A swingable sliding door apparatus for a vehicle comprising a door having an upper end portion, a fixed guide rail adjacent said upper end portion of said door and guide means connected to said upper end portion of said door and engaged in said guide rail for guiding the movement of the door in traveling between open and closed positions thereof, an end post against which said door abuts in the closed position, said guide means comprising a swing arm having one end pivotably attached to said door and a remote end, a roller assembly rigidly connected to said remote end and rollably supported in said fixed rail, said swing arm including a bent portion between said ends to straddle said post in said open position for maximizing the access opening when the door is in open position.

4,611,435

WINDOW PANE ADJUSTABLE IN HEIGHT, PARTICULARLY FOR MOTOR VEHICLES

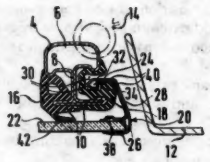
Hermann Warner, Trebur, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1984, Ser. No. 593,899

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312470

Int. Cl.⁴ E05F *11/38*

U.S. Cl. 49—374 **3 Claims**



1. In a door for an automotive vehicle having a window frame means for supporting a vertically adjustable window pane which is substantially flush with an adjacent door pillar of the vehicle, said window frame means being located wholly inwardly of the window pane and comprising a body portion, a bridge portion extending transversely of the body portion and a pair of oppositely facing flange portions extending transversely of the bridge portion at its end remote from the body portion, said body portion, bridge portion and flange portions defining a pair of oppositely facing channels, an elongated flexible stationary guide member disposed within and connected to one of said channels, a guide rail secured to a side edge portion of said window pane and which is slidably received within said one channel, and an elongated elastomeric sealing means carried by said other of said channels of said window frame means and being spaced inwardly of said side edge of said window pane, said sealing means including a sealing lip for engaging said window pane on its interior side to provide a seal between said window pane and said window frame means, the improvement being that said stationary guide member has an undercut facing interiorly and away from the window pane and which defines with other adjacent portions of said guide member a bead extending away from the window pane, and wherein said guide rail is a sheet metal strip folded back onto itself to provide first leg means which are secured to the window pane along its side edge, a web portion extending interiorly of said window pane and second leg means remote from said first leg means and extending inwardly from the side edge of the window pane and generally parallel with the window pane, said second leg means having a bead at its free end which defines an undercut facing toward the window pane and with the bead of said second leg means having a pair of converging tapered surfaces to enable said second leg means of said guide rail to be snapped into said flexible guide member and with said bead of said second leg means being received within said undercut of said stationary guide member to retain said window pane in place on said window frame means when said second leg means is assembled into said flexible stationary guide member, said bead of said stationary guide member having surfaces shaped complementary with adjacent surfaces of said second leg means and web portion of said guide rail to guide the movement of said window pane when its height is adjusted.

4,611,436

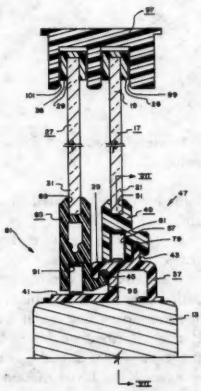
SLIDING DOOR ASSEMBLY

Harold L. Williams, Union City, Tenn., assignor to Southern Door Company, Union City, Tenn.

Filed Jun. 17, 1985, Ser. No. 745,800

Int. Cl.⁴ E05D *15/06*

U.S. Cl. 49—425 **8 Claims**



1. A sliding door assembly for being attached to support structure, said assembly comprising:

(a) a door panel having at least one substantially horizontal edge;

(b) an elongated support rail member attached to said support structure in a substantially horizontal position; and

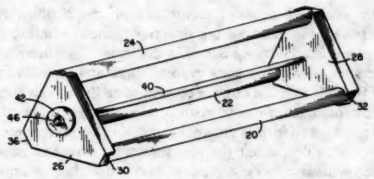
(c) support means attached to said door panel for slidably mounting said door panel to said support rail member and for allowing said door panel to move between open and closed positions, said support mount means including an elongated carriage member fixedly attached to said at least one horizontal edge of said door panel and including a pair of support rollers mounted to said carriage member and engaging said support rail member, said carriage member having a first end and a second end and having an elongated slot therein extending between said first and second ends for receiving said support rollers, each of said support rollers including a roller body for engaging said support rail member and axle means for engaging said carriage member, said slot in said carriage member having elongated channel means for receiving said axle means and for allowing said support rollers to move lengthwise along said slot as said door panel is moved between said opened and closed positions, said carriage member including stop means for stopping the lengthwise movement of said support rollers within said slot just prior to said door panel reaching said closed position to brake the motion of said door panel as said door panel is moved to said closed position.

4,611,437

SHARPENING SYSTEM AND RELATED METHOD

Morton Cohen, 41-27 Westmoreland St., Little Neck, N.Y. 11363

Filed Aug. 6, 1984, Ser. No. 637,854
Int. Cl.[4] B24B *3/54*
U.S. Cl. 51—181 R **7 Claims**



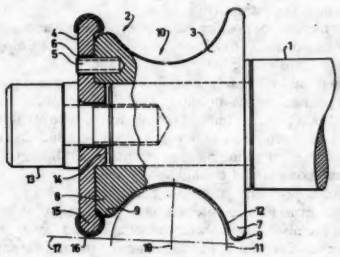
1. A sharpening system comprising a plurality of spaced rods and holding means to hold said rods in parallel relation, said rods being of different sharpening powers, said holding means including plates at opposite ends of the rods, one of said rods functioning or a tightening rod connecting the plates to lock the rods herein, the tightening rod being located centrally of the plates and extending therebetween, the rods being held in open framework relation by said plates, said rods being spaced apart from each other and from said tightening rod at substantial distances and exposing said tightening rod, the plates being provided with recesses to receive the ends of the rods, the recesses being truncated blind bores wherefrom the rods protrude outwardly in radial direction and protrude radially outwardly with respect to said tightening rod and beyond the plates thereby exposing the rods along the entire lengths thereof at positions external of said plates, and tightening means for selectively tightening and loosening the tightening rod, said rods being fixed in position when the tightening means is tightened and rotatable in position when the tightening means is loosened, one of said rods being a burnishing rod, the rest of said rods being sharpening rods of ceramic and including respectively different amounts of abrasive.

4,611,438

ABRASIVE WHEEL FOR PIN BORE CROWNS

Jan Sidén, Skellefteå , Sweden, assignor to Finsliparna AB, Skellefteå , Sweden

Filed Apr. 15, 1985, Ser. No. 723,472
Claims priority, application Sweden, Apr. 26, 1984, 8402295
Int. Cl.[4] B24D *5/00*
U.S. Cl. 51—206 R **7 Claims**



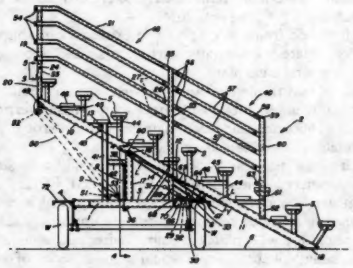
1. Abrasive wheel for grinding a drill bit of the kind having inserts of hard metal set into a head, the abrasive wheel comprising two circular flange portions and a circumferential profile groove located between the flange portions concentric about a rotary axis and corresponding to an end profile intended for the insert of a drill bit, characterized in that the flange portions and interposed profile groove are included in a first abrasive wheel body having a covering coating of abrasive agent adapted to grind hard metal and that the abrasive wheel includes at least one abrasive wheel body which is nonrotatably and concentrically connected to one flange portion of the first abrasive wheel body and which, at a greater radial distance from the axis of the abrasive wheel than said one flange portion of the first abrasive wheel body, has a circumferential end section with a substantially round cross-sectional form and a coating of an abrasive agent adapted to grind a head of a drill bit.

4,611,439

PORTABLE BLEACHER

Robert G. Graham, Jr., Ft. Payne, Ala., assignor to Steadfast, Inc. and Gametime, Inc., both of Fort Payne, Ala.

Filed Aug. 21, 1984, Ser. No. 642,857
Int. Cl.[4] E04H *1/12, 3/12*
U.S. Cl. 52—9 **16 Claims**



1. A portable bleacher comprising:

(a) an elongated mobile frame having opposed first and second side edges,

(b) an upper elongated stringer member carrying a plurality of upper seat members spaced along said upper stringer mem-

ber, and having outer and inner end portions and an intermediate portion,

(c) upper journal means mounting said intermediate portion in an elevated position on said mobile frame for swinging movement of said upper stringer member about a longitudinal swing axis transverse of said upper stringer member,

(d) a lower elongated stringer member carrying a plurality of lower seat members spaced along said lower stringer member, and having an upper end portion, a lower end portion and an intermediate portion,

(e) hinge means connecting said inner end portion and said upper end portion for swinging movement about a hinge axis parallel to said swing axis,

(f) an elongated link arm having first and second end portions,

(g) lower journal means mounting said first end portion of said link arm in a position on said mobile frame below said swing axis and between said swing axis and said second side of said mobile frame for swinging movement of said link arm about a journal axis parallel to said swing axis,

(h) pin means pivotally connecting said second end portion of said link arm to the intermediate portion of said lower stringer member for pivotal movement of said lower stringer member relative to said link arm about a pivotal axis parallel to said swing axis,

(i) whereby said upper and lower stringer members are adapted to swing between an operative position in which said stringer members are in longitudinal alignment declining toward said second edge, and an inoperative position in which said hinge means is above both said journal means.

4,611,440

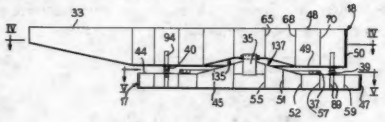
WALKING DRAGLINE BASE FRAME AND REVOLVING FRAME CONSTRUCTION

Ernest Kalve, 6700 W. Lake Rd., Newburgh, Ind. 47630

Continuation-in-part of Ser. No. 419,415, Sep. 20, 1982, abandoned. This application Feb. 14, 1984, Ser. No. 580,240

Int. Cl.[4] E04B *1/346*

U.S. Cl. 52—65 **22 Claims**



1. In a walking dragline excavator including a circular base frame adapted to lie directly in self-supporting relation on a ground level area and supporting a revolving frame connected to the base frame for rotation about an axis concentric with the base frame and wherein each of said frames comprises a massive hollow internally reinforced substantially planar horizontal load sharing frame structure:

each of said frame structures comprising a horizontal upper deck plate substantially vertically spaced above a lower horizontal base plate;

each of said frame structures having internal reinforcement comprising a plurality of concentric annular vertical girders supporting said deck plate on and in vertically spaced relation above said base plate;

each of said annular girders in each of said frame structures comprising concentric radially spaced vertical annular girder boundary webs fixedly connected by a respective zig-zag array of vertical alternately oppositely diagonally extending web plates forming with said annular girder boundary webs a symmetrical annular series of generally triangular cells in each of said girders;

all contiguous annular girders in each of said frame structures having one of said annular boundary webs forming a common boundary between the annular girders;

all of said boundary webs and all of said web plates being welded at their upper edges to the deck plate in the frame structure with which associated and all of the boundary webs and all of said web plates being welded at their lower edges to the base plate of the associated frame structure;

so that the boundary webs and the web plates in the triangular cell arrangement together with the deck and base plates in each frame structure function cooperatively to resist torsional stresses and to assume working loads by bending resiliently vertically under vertically imposed loads in the operation of the dragline excavator.

4,611,441

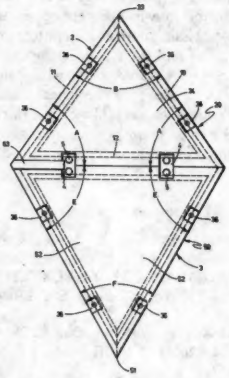
GEODESIC DOME

Thomas A. Wickens, 912 Alexandria Pike, Anderson, Ind. 46012

Filed Mar. 25, 1985, Ser. No. 715,713

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—81 **8 Claims**

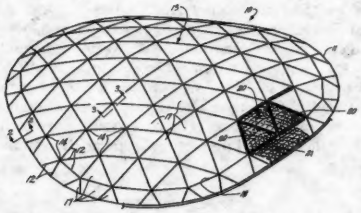


1. An insulated geodesic dome comprising a plurality of closed triangular building construction panels wherein each panel comprises a triangular frame formed by three frame members joined at their ends to form three apices, each frame having provided on the outside bottom edge thereof an angular recess adapted to combine with a like angular recess of an adjoining panel to form a channel adapted to receive an electrical service cable placed therein, and wherein each panel is provided with an outer cover having provided therein a plurality of notches adapted to be aligned in abutting relationship with a plurality of like notches in an outer cover of an adjoining panel, said notches being adapted to receive panel connector means placed therein and an inner cover having provided therein a plurality of notches adapted to be aligned in abutting relationship with a plurality of like notches in an inner cover of an adjoining panel and adapted to receive panel connector means placed therein, and wherein each panel is provided with a thermal insulating core disposed within the said triangular frame and between the said outer cover and the said inner cover, and wherein each panel is provided with a pair of vapor barriers adapted to seal the inside of the panel against the entrance of moisture; a plurality of panel connector means each means comprising a connector strap adapted to be inserted into a pair of opposing notches in the outer covers or a pair of opposing notches in the inner covers of two adjoining panels and adapted to be fastened by suitable fastening means to the two adjoining panels; a plurality of fastening means adapted to fasten the aforesaid connector means to pairs of adjoining panels; and a sealing means adapted to seal the interfaces between pairs of adjoining panels against the entrance of moisture into an insulated geodesic dome constructed of a plurality of said panels.

4,611,442
LARGE SPAN DOME

Donald L. Richter, Rolling Hills Estates, Calif., assignor to Temcor, Torrance, Calif.

Filed May 3, 1985, Ser. No. 730,164
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—81 **22 Claims**



1. A dome structure of desired planform perimetral outline adapted to be supported on foundation means along said outline and to provide a clear-span covering over a space bounded by the foundation means, the dome structure comprising

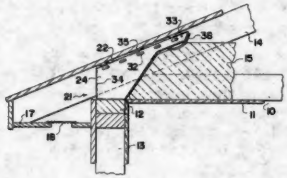
A. a primary network of interconnected structural members adapted to be supported by the foundation means for spanning the space bounded by the foundation means, for defining a principal curvature of the dome structure, and for dividing the principal curvature into a plurality of openings of selected boundary configuration, and

B. a corresponding plurality of discrete minor dome assemblies each having a curvature substantially greater than the principal curvature of the dome structure, each minor dome assembly having a perimetral configuration substantially congruent to the boundary configuration of the corresponding opening and connected essentially along the entirety of its perimeter to the primary network for closing the corresponding opening in a weathertight manner.

4,611,443
WALL LINE INSULATION PILLOWS

Ralph H. Jorgensen, Box 7, Site 9, R.R. #6, Calgary, Alberta, Canada T2M 4L5, and Patrick J. Windle, 18 Wakefield Drive S.W., Calgary, Alberta, Canada T3C-2W7

Filed Jan. 13, 1984, Ser. No. 570,323
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—95 **1 Claim**

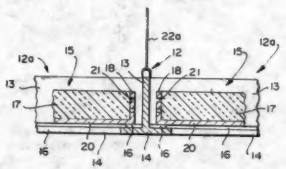


1. A wall line insulation pillow locatable with a wedge-shaped recess defined by adjacent roof rafters, roof panels extending therebetween and adjacent ceiling joists and ceiling panels therebetween, said pillow maintaining the insulation R value between attic insulation and the outer surface of a structural wall, comprising in combination a substantially wedge-shaped block of insulating material having a first planar substantially rectangular face, a substantially rectangular wall extending upwardly from one edge of said first face to distal edge of said rectangular wall, spaced and parallel side walls extending upwardly from said first face and a second face extending from said distal edge of said rectangular wall to a junction at an edge of said first face opposed to said one edge thereof with the thickness and hence the R value of said pillow increasing from said opposed edge of said first face towards said one edge thereof at said rectangular wall, said pillow, when in situ being situated with said first face forming the base thereof and engaging said ceiling panels between adjacent ceiling joists and air vent means being formed through said second face from the front to the rear thereof, said rectangular wall joining contiguously with said first planar face at a corner whereby said pillow can be slid into place in said wedge-shaped recess with said first face in contact with said ceiling panel until said second face engages said roof panel, and a flexible membrane secured by one edge thereof to the junction between said first and second faces and depending downwardly therefrom when said pillow is in situ between adjacent roof rafters.

4,611,444
SANITARY ACOUSTICAL CEILING

Martin Nassof, Cliffside Park, N.J., assignor to Simplex Ceiling Corp., Hoboken, N.J.

Filed Feb. 28, 1985, Ser. No. 707,030
Int. Cl.[4] E04B *1/82*
U.S. Cl. 52—145 **6 Claims**



1. A suspended ceiling system for a room, which comprises

a plurality of inverted T-shaped members suspended from the structural ceiling of the room and extending across the room, each said T-shaped member having a horizontal base portion and a vertical leg portion;

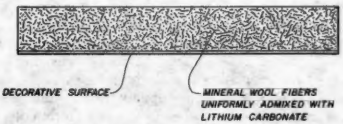
a plurality of open metal ceiling panels having two pairs of opposed sides and an unperforated bottom, and acoustical insulation in said panels, at least one pair of opposed sides being perforated, and

each said panel being supported by a pair of said inverted T-shaped members with said panel bottom and said pair of opposed perforated panel sides spaced from and facing said horizontal base portion and said vertical leg portion, respectively, of said pair of inverted T-shaped members.

4,611,445
SAG-RESISTANT CEILING PANEL

James O. Pressley, Millersville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Dec. 7, 1984, Ser. No. 679,496
Int. Cl.[4] E04B *1/88*
U.S. Cl. 52—144 **6 Claims**



1. A ceiling panel resistant to sag when exposed to a fire in a room comprising mineral wool fibers and reasonably uniformly distributed therein about 1% to about 6% lithium carbonate, or the fused decomposition product thereof, based on the weight of the mineral wool fibers.

4,611,446
CABLE ANCHORING DEVICE

Allan E. Beavers, 7961 S. Kendall Blvd., Littleton, Colo. 80123, and Robert A. Fulcher, 2339 S. Balsam St., Lakewood, Colo. 80227

Filed Dec. 26, 1985, Ser. No. 813,404
Int. Cl.[4] E02D 5/80
U.S. Cl. 52—163 10 Claims

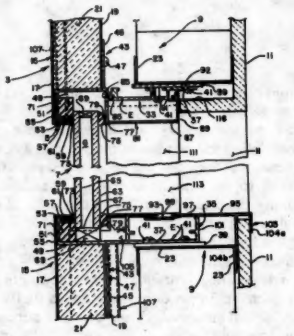
1. A cable anchor which comprises: an elongate rigid blade-like member having upper and lower ends, a curved section extending at least from a point intermediate the ends thereof to its upper end defining a concave inner face and a convex outer face, an integrally-formed dimple located intermediate the upper and lower ends of said member projecting from its outer face, a downwardly-opening integrally-formed bendable ear disposed beneath the dimple and projecting from the inner face of said member, and a cable opening in the dimple for passing a cable from the outer face of said member onto the inner face thereof into position to be crimped and secured between the said inner face and the ear, a portion of said dimple bordering the top of said cable opening defining a fulcrum located at the apex of an angle formed by the said fulcrum and the upper and lower ends, and said curved section being operative upon insertion of the blade member lower end first into the ground in an essentially upright position to coaperating with said fulcrum and defining means effective to lift and rotate said member into a crosswise position when said cable is tensioned thus anchoring the assembly in the hole produced when it in inserted.

4,611,447
CURTAIN WALL AND WINDOW FRAME CONSTRUCTION

Oliver A. Krechel, St. Louis County, Mo., assignor to Profile Systems, Inc., St. Louis, Mo.

Filed Sep. 14, 1983, Ser. No. 531,859
Int. Cl.[4] E06B 7/14
U.S. Cl. 52—209 8 Claims

1. In an exterior wall of a building of curtain wall construction, the building having an internal frame means, the exterior wall being secured to said building frame means, and having at least one window opening therein with an exterior wall panel above and below said window opening, said window opening having at least one pane of glass or the like therein closing said window opening, said window opening further having a top, a bottom, and sides, wherein the improvement comprises: upper means at the top of said window opening for securing said upper wall panel to said building frame means, lower means at the bottom of said window opening for securing said lower exterior wall panel to said building frame means, said upper and lower panel securing means each having an inwardly facing surface cooperable with the outer face of the upper and lower margins of the said window pane when the latter is installed within said window opening thereby to prevent outward movement of said window pane with respect to said upper and lower securing means and to seal said window pane with respect to said upper and lower securing means, said lower securing means having an outwardly facing surface proximate the lower, inner face of said window pane but spaced inwardly therefrom, a gasket between said lower, inner face of said window pane and said outwardly facing surface of said lower securement means thereby to sealingly hold the lower margin of said window pane captive between the inner and outwardly facing surfaces of said lower securing means, means securable in place relative to said upper securement means on the inside of the window pane proximate the upper,

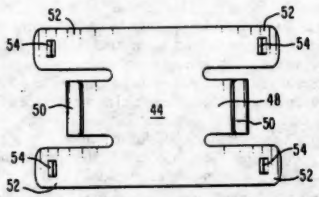


inner margin of said window pane, a gasket interposed between said upper inner margin of said window pane and said securable means thereby to hold the upper margin of the window pane captive between the inner and outer facing surfaces of said upper securing means via the securable means, said curtain wall construction incorporating outer building panels, said outer building panels each comprising an outer sheet, an inner sheet, and a core of insulating material secured to the inner sheet, and a core of insulating material secured to the inner faces of said inner and outer sheets, said outer sheet being so formed that portions thereof define the upper and lower surfaces of said window opening with the said outer sheets being bent inwardly toward said building and then vertically so as to constitute said inwardly facing surfaces cooperable with the outer, upper and lower margins of said window pane.

4,611,448
POST COVER MOUNTING CLIP

Ronald B. De Long, Lowell, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 22, 1985, Ser. No. 693,543
Int. Cl.[4] E04B 2/00
U.S. Cl. 52—239 1 Claim



1. In combination with a space-dividing wall panel system

which includes at least a pair of space dividing wall panels having vertical side rails with inwardly directed angled flanges thereon, a cylindrical support post interconnecting and supporting said panels disposed therebetween and a post cover spanning the space between said rail flanges on adjacent sides of said panels, said post cover having complementary angled flanges thereon in mating engagement with the angled flanges on said side rails, the improvement which comprises;

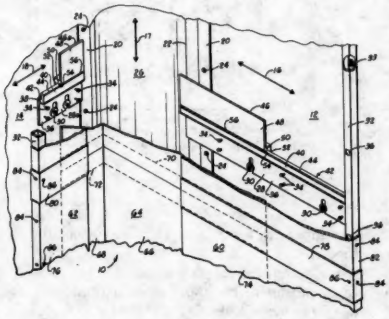
a plurality of curved spring clips in contacting relationship with said cylindrical support posts, each of said spring clips including a central body portion having curved resilient detent means thereon and a pair of leg portions extending laterally from each side of said body portion with each of said leg portions having detent means juxtapositioned said curved resilient detent means, said mating flanges on said rails and said post cover being disposed between said resilient detent means and a pair of said juxtapositioned detent means whereby said post cover is thereby secured to said space dividing wall panels in a planar relationship therewith.

4,611,449

EXTERIOR EXPANSION JOINT COVER ASSEMBLY

Michael D. Wilson, and Dale A. Schmitt, both of Oklahoma City, Okla., assignors to Metalines, Inc., Oklahoma City, Okla.

Filed Apr. 11, 1984, Ser. No. 599,200
Int. Cl.⁴ E04B *1/00*
U.S. Cl. 52—278 **22 Claims**



1. An expansion joint cover assembly for enclosing a void between orthogonally aligned movable surfaces, comprising:

first base slide means defining a slideway secured to the surface on one side of said void;

second base slide means defining a second slideway secured to the surface on the other side of said void at a right angle to said first base slide means;

first cover slide means slidingly engaged in and supported by said first base slide means;

second cover slide means slidingly engaged in and supported by said second base slide means; and

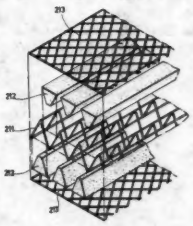
cover plate means formed as first and second panels disposed at a right angle with said first panel secured to said first cover slide means and said second panel secured to said second cover slide means.

4,611,450

MULTI-REINFORCED CONSTRUCTION PANEL

Kai-Nan Chen, No. 111 Chien Chung Street, Taichung, Taiwan (400)

Filed Sep. 16, 1983, Ser. No. 533,429
Int. Cl.⁴ E04C *1/00*; D03D *13/00*; B32B *5/14*
U.S. Cl. 52—309.4 **8 Claims**



1. A structural rreinforcement grid consisting essentially of two substantially planar sections of wire mesh and a third section of multiply-pleated wire mesh or of multiply-pleated metal plate;

the third section having a configuration, in profile, of acute "V" formations, natural wave formations, square wave formations or trapezoidal formations;

said third section being sandwiched between and welded to each of the two substantially planar sections at points of contact; and

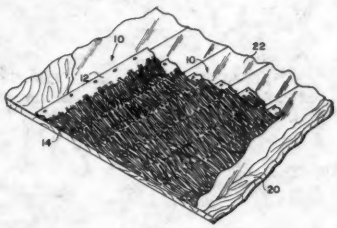
the grid being one wherein said substantially planar sections lie in substantially parallel planes.

4,611,451

SIMULATED THATCH ROOF SHINGLES

John Symbold, 2323 Dixie Belle Ave., Orlando, Fla. 32806

Filed Jun. 21, 1984, Ser. No. 622,967
Int. Cl.⁴ E04D *1/00*
U.S. Cl. 52—555 **6 Claims**



1. A simulated thatched roof for a structure having a roof surface and a waterproof covering disposed over said roof surface; and

overlapping one-piece unitary shingles attached to said roof surface and overlaying said covering, each of said strips having a slight taper from its proximal end to its distal end and each of said shingles having an upper border portion contiguous with a plurality of depending narrow strips of various lengths, each of said strips separated from adjacent ones thereof by a space essentially complementary to the shapes of said strips and approximately equal in width to the width of said strips, each of said strips including a shallow longitudinal crease along at least a portion thereof, and a slight curling of the distal end thereof, said shingles disposed such that said strips of one shingle over-

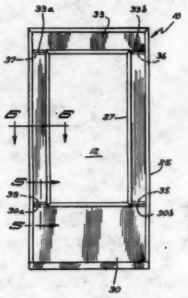
lay said border portions of other shingles to thereby produce a simulation of a natural thatched roof.

4,611,452

TAPE SEALED SURFACE LAYER FOR DOOR CONSTRUCTION

James L. Ralph, Shoreview, Minn., assignor to Cole Sewell Corporation, St. Paul, Minn.

Filed Oct. 28, 1985, Ser. No. 792,298
Int. Cl.[4] E06B *3/70*
U.S. Cl. 52—455 **4 Claims**



1. In connection with a combination screen and storm door having an inner core construction and having a metal surface layer overlying said core at the outer and inner side of said door, said door having a screen and window opening therein, one of said surface layers comprising

a plurality of pieces arranged and assembled to have abutting edges in forming an outer skin layer for said door,

said pieces forming seams at their abutting edges,

said layer having an outward and an inward side,

an adhesively applied tape overlying each of said seams on the inward side of said layer, and

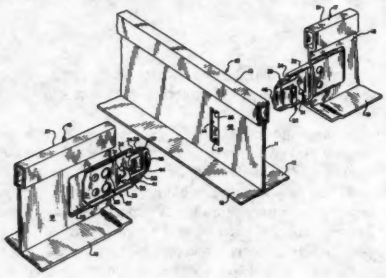
said tape being arranged and constructed to secure said pieces together into an integral layer and to cause said seams to be sealed against the penetration by elements of weather.

4,611,453

SUSPENSION CEILING GRID CONNECTORS

Robert F. Worley, Bay Village, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Jul. 25, 1985, Ser. No. 758,772
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—667 **12 Claims**



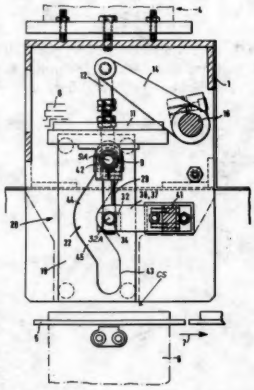
1. A suspension ceiling grid system comprising a plurality of elongated runners providing a central web and opposed panel supporting flanges extending in opposite directions from said web, said runners being interconnected at intersections to provide a grid defining panel receiving openings, at least some of said intersections providing a through-runner and two opposed runner ends connected to said through-runner on opposite sides thereof, said through-runner having a connector opening means in the web thereof, said runner ends providing end connector means extending longitudinally into said connector opening means from opposite sides thereof, said connector means providing lock means preventing separation of said runners when longitudinal forces are applied to said runner ends tending to move said connectors out of said connector opening means, said runner ends and through-runner along with said connector means permitting rotation of said through-runner about its longitudinal direction, said rotation of said through-runner allowing removal of one of said connectors from said connector opening means without requiring substantial longitudinal movement of said one runner end.

4,611,454

CAPPING MACHINE

Wilhelm Proepper, Langenfeld, Fed. Rep. of Germany, assignor to Benz & Hilgers GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,625
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421177
Int. Cl.[4] B65B *7/28*; B67B *3/00*
U.S. Cl. 53—307 **12 Claims**



1. In an apparatus for putting caps on vessels, the apparatus having

a housing defining a capping station;

conveyor means for transporting a longitudinally extending row of the vessels through the station;

a supply of the caps on the housing above the capping station;

a gripper shaft extending along a transverse shaft axis in station beneath the supply;

a gripper carried on the shaft; and

drive means for rotating the shaft between one end position with the gripper engaged upward against the cap supply and an opposite end position with the gripper beneath the shaft and holding a cap picked off the supply above a vessel in the station, and for vertically displacing the shaft generally perpendicular to its axis between upper and lower positions, the improvement wherein the drive means for the shaft comprises

a sliding-action linkage having a vertically extending guide slot formed in the housing and a roller carried on the shaft and snugly fitted in the slot for vertical guided displacement of the shaft and gripper, and

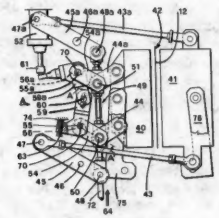
a sliding-bar linkage connected between the shaft and the housing and including a rod fixed on and extending radially from the shaft and a crosshead pivotal on the housing and slidably receiving the rod for effecting its rotation.

4,611,455

CONTROL DEVICE FOR WELDING RODS IN PACKAGING MACHINES

Franco Aiuola, and Luciano Nannini, both of Bologna, Italy, assignors to Emhart Corporation, Hartford, Conn.

Filed Sep. 7, 1983, Ser. No. 530,165
Claims priority, application Italy, Sep. 7, 1982, 3522 A/82
Int. Cl.[4] B65B *51/14, 51/26*
U.S. Cl. 53—373 **5 Claims**



1. A device for controlling the movement of sealing bars of a packaging machine for packaging products in wrappers of heat-sealable material, said device comprising at least two sealing bars, a frame, a control mechanism for opening and closing said sealing bars, said control mechanism including at least two opening and closing arms, and at least two control arms first and second pins integral with each other and having axes eccentric with each other, each said sealing bar being attached to ends of a respective control arm, said control arms being pivotally mounted respectively on said first and second pins, said second pin being pivotally mounted on said frame, said first pin being rotatable about the axis of said second pin upon movement of said control arms during movement of said sealing bars toward each other, a further arm extending from one of said pins, pneumatically controlled damping means, said further arm acting on said damping means because of rotation of said first pin about the axis of said second pin following the thrust of said control mechanism as the sealing bars are closed.

4,611,456

PROCESS FOR MAKING A VACUUM SKIN PACKAGE AND PRODUCT FORMED THEREBY

Mario Gillio-tos, Rho Milan, Italy; Enzo Vassarotti, Bugneaux Sur Rolle, Switzerland; Henry G. Schirmer, Spartanburg, S.C., and Gottfried von Bismarck, Lutry, Switzerland, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 633,743, Jul. 23, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 831,118
Claims priority, application United Kingdom, Aug. 23, 1983, 8322662
Int. Cl.[4] B65B *11/52*
U.S. Cl. 53—427 **1 Claim**

1. In the method of making a vacuum skin package having a substrate, a top film, and a product therebetween in a vacuum chamber, the improvement comprising the steps of:

(a) applying an impervious film to one surface of the substrate by means of pneumatic pressure difference; said impervious film having smaller dimensions than the dimensions of the substrate, the uncovered portion of the substrate forming grip-enhancing edges;

(b) placing the product to be package on said impervious film;

(c) positioning a top film over the product;

(d) evacuating the space between the top film and product;

(e) Forming the top film around the periphery of the product and into sealing contact with the impervious film on the substrate by means of pneumatic pressure; and

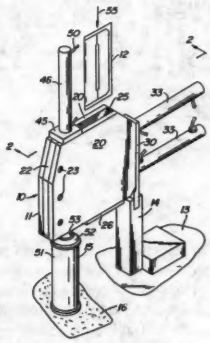
(f) Trimming off the grip-enhancing edges which extend beyond the impervious film thereby producing a vacuum skin package.

4,611,457

CAN STUFFER AND METHOD

Norman Bittner, Cherry Hill, N.J., assignor to Enviro-Spray Systems Incorporated, Montgomeryville, Pa.

Division of Ser. No. 398,887, Jul. 16, 1982, Pat. No. 4,531,341. This application Mar. 20, 1985, Ser. No. 713,874
Int. Cl.[4] B65B *63/04*
U.S. Cl. 53—429 **2 Claims**



1. A method for inserting an elongated expandable pouch into an aerosol-type container having therein a liquid product to be dispensed on demand and including a top opening substantially smaller than the width of the container and of the type wherein the expandable pouch includes separately compartmented internal gas generating components which expand said pouch to pressurize the container after it has been inserted therein, comprising the steps of:

receiving in a chamber disposed between two substantially parallel plates and first and second opposing ends said elongated expandable pouch with its width parallel to said plates in a substantially vertical and unexpanded condition, said elongated pouch in the substantially unexpanded condition having a width substantially greater than the width of said opening of said container into which said elongated pouch is to be inserted;

deforming the expandable pouch in the chamber into an elongate temporarily collapsed product extending along the second chamber end with pusher means mounted in said chamber between said plates and extending along said first end thereof, said pusher means being movable parallel to said plates between a first position adjacent said first end and a second position adjacent a second end to collapse and pouch said step of deforming being such that the temporarily collapsed pouch has a width at least as small as the width of the opening of the container, allowing said pouch to enlarge in a direction perpendicular to said plates along said second end by way of said receiving chamber having a cross section at the second end greater than the distance between said parallel plates for allowing said enlargement of the elongate collapsed pouch to prevent

crushing thereof and said second end having a cross-sectional dimension not substantially larger than the opening in said container; and

ejecting the temporarily collapsed pouch into a container disposed below said chamber at said second edge with ejector means, movable in said chamber along said second end in a direction perpendicular to the direction of movement of said pusher means, thereby allowing said pouch to expand within said container to pressurize and propel the product to be dispensed.

4,611,458

DEVICE FOR PACKING FILLED BAGS INTO BOXES

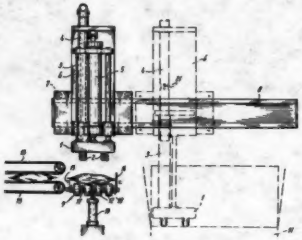
Bouwe Prakken, Spijkerlaan 9, 3471 EG Kamerik, Netherlands

Filed Apr. 24, 1985, Ser. No. 726,697

Claims priority, application Netherlands, May 4, 1984, 8401437

Int. Cl.[4] B65B *5/08*

U.S. Cl. 53—537 **4 Claims**



1. A device for packing filled bags into boxes, in particular bags filled with crisps, said device comprising a suction box having a plurality of suction cups, first means for moving said suction box vertically, second means for moving said suction box along a horizontal track between a bag pick-up position and a bag delivery position, a plurality of spaced-apart conveyor belts adapted to support and move a plurality of bags formed in a row on said plurality of conveyor belts to said pick-up position, means for arranging said bags in said row on said spaced-apart conveyor belts, means disposed between said space-apart conveyor belts for pushing and positioning said row of bags at said pick-up position against said suction cups for gripping by said suction cups.

4,611,459

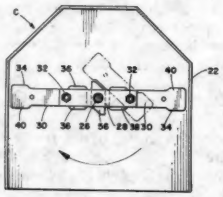
MOWING APPARATUS WITH IMPROVED REVERSIBLE CUTTING BLADE

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Filed May 30, 1985, Ser. No. 739,226

Int. Cl.[4] A01D *55/18, 35/28*

U.S. Cl. 56—12.7 **12 Claims**



1. A mowing apparatus comprising:

a prime mover;

an arm assembly operatively connected at a first end with said prime mover;

a mowing unit operatively connected with a second end of said arm assembly including:

(a) a deck,

(b) a motor means,

(c) a rotatable shaft operatively connected with said motor means,

(d) a mounting hub connected to said shaft,

(e) a pair of reversible blades connected to said mounting hub, each blade having cutting surfaces disposed at corners of the blade whereby the blade life is increased by reversing the blade,

(f) means for fastening said pair of reversible blades to said mounting hub, said fastening means defining a fastening axis, and,

(g) means for stopping rotation of said blades about said fastening axis when said blades are displaced upon encountering a predetermined force, said stopping means positioned approximately midway between said reversible blade pair for engaging each of said blades at an area remote from said cutting surfaces.

4,611,460

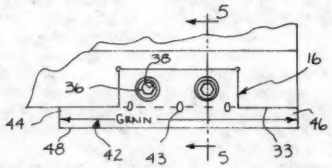
LAWN MOWER BLADE WITH REPLACEABLE CUTTER

James D. Parker, Rte. 1, Box 327, Winfield, Mo. 63389

Filed Oct. 25, 1985, Ser. No. 791,601

Int. Cl.[4] A01D *55/18*

U.S. Cl. 56—295 **7 Claims**



1. A lawn mower blade for use with rotary lawn mowers, said blade being comprised of an elongated support blade adapted to be connected to a lawn mower at a central portion thereof intermediate opposite ends of the support blade, said support blade having a recess at a top side of said supporting blade receiving a replaceable cutter therein, said cutter being comprised of a body portion closely receivable within said recess and abutting against a back thereof and a cutter head extending laterally from said body portion and abutting against a straight leading edge of said support blade and means for attaching said body portion to said support means on the top side of said support blade, said recess having an opening at a leading edge of said support blade adjacent an end thereof and said cutter head having a front knife edge and a rear bearing edge extending on opposite sides of said opening, said rear bearing edge abutting against said leading edge of the blade support on said opposite sides of said opening.

4,611,461

OLIVE PICKER WITH SPEED CONTROL AND SELECTED PICKER DIMENSIONS

James C. Tyros, River Rd., New Ipswich, N.H. 03071

Filed May 4, 1984, Ser. No. 607,235

Int. Cl.[4] A01D *46/00*

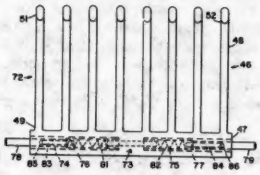
U.S. Cl. 56—328 R **3 Claims**

1. Portable hand supported and hand manipulated olive picking apparatus of the type comprising a picking head, gimbal supported on the end of an elongated handle, and having, in the head, a plurality of tines on a shaft rotated by a motor, the motor powered by a conduit leading down the handle to a power source at ground level, said apparatus characterized by:

control means, including a variable speed means, on the

handle, proximate ground level for operating said motor at selected speeds to rotate said tines in the range of 15 to 75 r.p.m. to conform with the age and skill of the operator; and

quick release means having a single elongated shaft along which all of said tines are spaced to extend normal thereto, said shaft having opposite ends each with an axial bore, and said shaft having a pair of shaft rods, each slidable in one of said bores, a pair of coil springs each seated in one



of said bores to bias the shaft rod therein, outwardly to project from said bore, a pair of longitudinally extending slots, each in one of the ends of said shaft and a pair of pins, each affixed to one of said shaft rods and projecting through the adjacent slot;

movement of said pins toward each other against pressure of said springs retracting said shaft rods into said bores for removal and replacement of said tines and shaft from said head.

4,611,462

OPEN-END SPINNING MACHINES

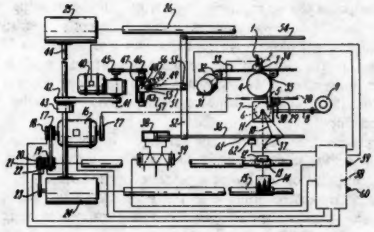
Vernon G. Pinner, Burnley, and John Richardson, Oldham, both of England, assignors to 501 Hollingsworth (UK) Limited, Accrington, England

Filed Oct. 11, 1984, Ser. No. 659,596

Claims priority, application United Kingdom, Oct. 12, 1983, 8327290

Int. Cl.[4] D01H *13/26, 15/02*

U.S. Cl. 57—263 **9 Claims**



1. In means for starting a yarn spinning operation in an open-end spinning machine, said machine comprising (a) spinning means for spinning yarn; (b) fibre feed means for feeding fibres to said spinning means; (c) yarn take-up means for receiving said spun yarn including yarn delivery rollers, a yarn take-up package onto which said spun yarn is wound, and means for establishing a yarn path therebetween; (d) drive means for driving in rotating said yarn take-up means including said delivery rollers and said yarn package in a first direction for delivering said spun yarn from said spinning means to said package; and (e) yarn reserve-forming means for forming a reserve length of yarn in said yarn path between said package and said spinning means; the improvement comprising:

i. said yarn reserve-forming means being effective to form said reserve length of yarn between said yarn delivery rollers and said spinning means; and

ii. control means for controlling said drive means to rotate said yarn take-up means at a controlled first rate in a second direction opposing said first direction, and for controlling and causing a simultaneous movement of said reserve-forming means in a direction effective to form said reserve length of yarn from said spun yarn wound onto said package and further for controlling and causing movement of said yarn reserve-forming means at a controlled second rate in a direction effective to pay out the thus-formed reserve length of yarn at a controlled rate.

4,611,463

OPEN-END SPINNING MACHINE

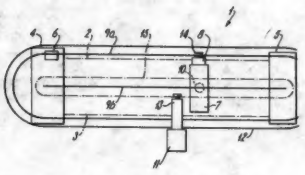
Alan Smith, Accrington, and Stephen W. Yates, Greater Manchester, both of England, assignors to Hollingsworth (U.K.) Ltd., Accrington, England

Filed Jun. 11, 1985, Ser. No. 743,441

Claims priority, application United Kingdom, Jun. 13, 1984, 8415001

Int. Cl.[4] D01H *15/00, 11/00, 9/10*

U.S. Cl. 57—263 **10 Claims**



1. An open-end spinning machine comprising:

(a) double-sided elongate frame means having opposed first and second sides;

(b) a plurality of spinning stations arranged along each of said first and second sides of that frame means, each said spinning station including a spinning chamber;

(c) first track means;

(d) a piecer-cleaner robot able to patrol along the first track means, to face the spinning stations along said opposed first and second sides thereof in succession in a repeating sequence;

(e) second track means separate from the first track means;

(f) a doffer robot which is able to patrol along said second track means thereby orbiting said elongate frame means, and is able to face said spinning stations on said first and second opposed sides of the frame means in succession in a repeating sequence during said orbiting,

(g) winding tube supply means positioned at one given location along said second track means and adapted to supply said doffer robot with yarn winding tubes to be subsequently applied individually to respectively ones of said spinning stations when said respective spinning stations are being serviced by said doffer robot;

wherein the configurations of the first and second track means and those of the doffer and piecer-cleaner robots are such that the doffer robot can pass the piecer robot while the piecer robot is servicing any one of the spinning stations on both of said first and second sides of the frame means.

4,611,464

ROTOR ASSEMBLY FOR A GAS TURBINE ENGINE AND METHOD OF DISASSEMBLY

Frederick C. Hetzer, Northford, and Guy W. Miller, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1984, Ser. No. 606,060

Int. Cl.[4] F02C *1/06, 3/10*

U.S. Cl. 60—39.161 **16 Claims**

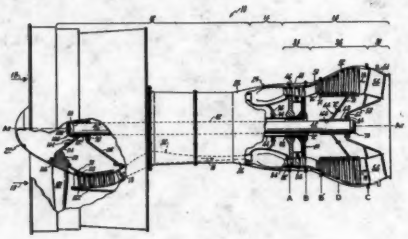
1. In an axial flow gas turbine engine of the type which

includes a compression section, a turbine section, a flow path for working medium gases which extends axially through the sections, and a stator assembly having an outer case extending circumferentially about the working medium flow path, the engine further including a bearing supported from the outer case and disposed about an axis of rotation and a rotor blade assembly which is supported by the bearing and which has an array of rotor blades extending outwardly across the working medium flow path into proximity with the outer case, the improvement which comprises:

a rotor shaft which extends axially through the engine between the compression section and the turbine section;

a bearing which is adapted to engage an annular second shaft and to support only said rotor shaft and said annular second shaft;

a bearing support which extends radially inwardly from the outer case to support the bearing;



an annular second shaft which is joined to the rotor blade assembly, which engages the bearing to rotatably support the rotor blade assembly, which rotatably supports only said rotor shaft and which is capable of movement in the axial direction with respect to the rotor shaft; and,

a means for axially and circumferentially coupling the rotor shaft to the second shaft;

wherein uncoupling of said means for coupling the rotor shaft and the second shaft permits relative movement in the axial direction between the rotor shaft and the second shaft to separate the shafts and to permit withdrawal of the rotor shaft from the engine to an extent which provides access to the interior of the engine while the second shaft supports the rotor blade assembly from the bearing to avoid relative radial movement between the rotor blade assembly and the stator assembly.

4,611,465

EXHAUST GAS BY-PASS SYSTEM IN A TURBOCHARGER FOR AN INTERNAL COMBUSTION ENGINE

Yuuichi Kato, Susono; Mitsuyuki Ugajin, Okazaki, and Tatsuya Kawakita, Aichi, all of Japan, assignors to Toyota Jidosha Kabushi Kaisha, Aichi, Japan

Filed Oct. 15, 1984, Ser. No. 660,885

Claims priority, application Japan, Jun. 22, 1984, 59-127283

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **9 Claims**

1. An internal combustion engine comprising:

an engine body having a plurality of cylinders;

intake passageway means for introducing air into the engine;

first exhaust passageway means connected to a first group of the cylinders;

second exhaust passageway means connected to a second group of the cylinders;

a turbine unit for receiving exhaust gas from the exhaust passageway means and for receiving energy from the thus received exhaust gas;

a discharge passageway means for receiving the exhaust gas from the turbine unit; and

a compressor unit operated by the turbine unit for compressing the air in the intake passageay means;

wherein said turbine unit comprises:

a housing;

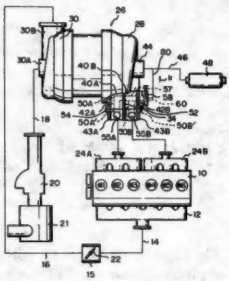
a turbine wheel having a central axis, said turbine wheel being mounted in the housing for rotation about its axis;

a shaft co-axial with said axis and mechanically connecting the turbine wheel to the compressor unit;

a pair of scroll passageways juxtaposed along said axis and around said turbine wheel, the scroll passageways being formed between the housing and the turbine;

said housing having an inlet opening in a position adjacent and tangential to the turbine wheel for connecting the scroll passageways with the first and second exhaust passageway means, respectively, and an outlet opening in a position adjacent to and substantially along the axis of the turbine wheel and connected to the discharge passageway means;

a tubular boss portion extending away from a main body of said housing and being disposed substantially parallel to



said axis at a position radially spaced from the outlet and adjacent to the inlet, an end of said tubular boss portion closest to said main body being closed and defining a bottom inner surface;

by-pass passageway means extending substantially in a plane tangentially to said axis, a substantial portion of said by-pass passageway means being formed in the housing, said by-pass passageway means having first ends opening, in said exhaust passageway means near and upstream of the inlet, to the flows of the exhaust gas introduced into the juxtaposed scroll passageways and at least one second end extending to said bottom inner surface of the tubular boss portion;

by-pass control valve means arranged in said tubular boss portion for selectively opening or closing the at least one second end of the by-pass passageway means; and

actuator means responsive to the pressure of the air in the intake means downstream of the compressor unit for operating the by-pass control valve.

4,611,466

VEHICLE POWER SYSTEM COMPRISING AN AUXILIARY ENGINE IN COMBINATION WITH THE MAIN VEHICLE ENGINE

Edgar L. Keedy, Liberty Center, Ohio, assignor to Remi L. Victor and Mary H. Victor, both of Dearborn Heights, Mich.

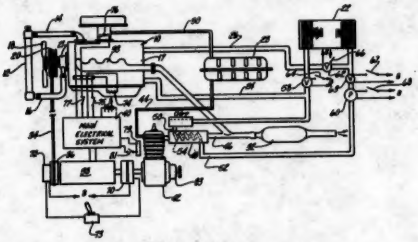
Filed Feb. 4, 1985, Ser. No. 698,173

Int. Cl.[4] F02D *25/00*

U.S. Cl. 60—714 **10 Claims**

1. In a vehicle having a main internal combustion engine for driving the vehicle and an electrical system and having a main liquid cooling system connected to the main engine and having fluid passage means for circulating liquid coolant of the cooling system through the engine block of the main engine, and with the vehicle having an operating compartment and further having a vehicle heating system selectively actuable for providing heat to the operating compartment from the main en-

gine cooling system, the combination comprising an auxiliary internal combustion engine, an auxiliary liquid cooling system connected to said auxiliary engine and connected to said main liquid cooling system, heat transfer means selectively actuable for connecting the vehicle heating system to said auxiliary liquid cooling system for transferring the heat absorbed from said auxiliary engine to the vehicle compartment heating system, said heat transfer means being selectively actuable to a first condition to circulate the liquid coolant for the auxiliary cooling system to the compartment heating system and blocking flow from the auxiliary cooling system to the engine block via said fluid passage means, said heat transfer means being selectively actuable to a second condition to circulate the liquid coolant of the cooling system from said heat exchanger to the engine block via said fluid passage means.

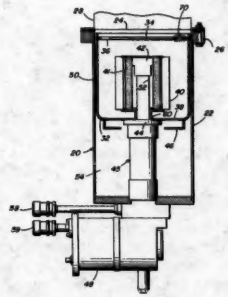


4,611,467

METHOD AND APPARATUS FOR THROTTLING GAS FLOW TO A CRYOPUMP

John F. Peterson, Lynnfield, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Jun. 10, 1985, Ser. No. 742,885
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **7 Claims**



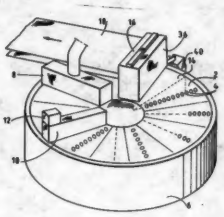
1. A cryopump comprising a cold first stage and a colder second stage, a second stage cryopanel, a radiation shield surrounding the second stage and a first stage orifice plate closing the radiation shield, the orifice plate having a plurality or orifices therein for allowing restricted flow of gas into the radiation shield to the second stage cryopanel, at least one of the orifices being closed by a removable closure secured to the orifice plate at the closed orifice.

4,611,468

METHOD OF PRODUCING FROZEN BLOCK BODIES

Kaj H. Degn, Hasselager, Denmark, assignor to O.G. Hoyer A/S, Hojbjerg, Denmark

Filed Feb. 8, 1985, Ser. No. 699,559
Claims priority, application Denmark, Feb. 9, 1984, 565/84
Int. Cl.[4] A23G *9/00*
U.S. Cl. 62—71 **3 Claims**



1. A method for producing stickless frozen block bodies with the use of a freezing machine which produces stick-carrying frozen block bodies of the ice cream lolly type, comprising the steps of

filling freezing pocket members with the substance to be frozen,

freezing the substance into block bodies in the freezing pocket members, while the freezing pocket members are moved through a freezing zone,

handling and inserting individual sticks by means of automatic handling means into the freezing pocket members during the freezing of the substance into block bodies such that one end of the sticks protrudes outwardly from the block bodies,

moving the freezing pocket members to a demoulding station at which time the sticks are frozen fast in the block bodies,

gripping the protruding end of the sticks by gripping means at the demoulding station and lifting the sticks to remove the block bodies from the freezing pocket members,

removing the sticks from the block bodies by combing means cooperating with surface portions of the block bodies such that there is relative retraction movement between the gripping means and the combing means,

disposing of the removed sticks, and

delivering the stickless block bodies to a receiver

delivering the stickless block bodies to a receiver station.

4,611,469

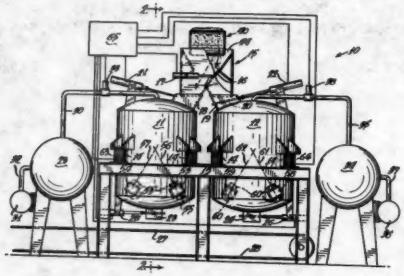
METHOD AND APPARATUS FOR COOLING FOUNDRY SAND

Albert Musschoot, Barrington, Ill., assignor to General Kinematics, Barrington, Ill.

Division of Ser. No. 198,462, Oct. 20, 1980, Pat. No. 4,348,867, which is a division of Ser. No. 63,577, Aug. 3, 1979, Pat. No. 4,252,001, which is a continuation-in-part of Ser. No. 918,515, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 780,670, Mar. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 761,414, Jan. 27, 1977, abandoned. This application Jun. 25, 1982, Ser. No. 391,987
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—100 **2 Claims**

1. The method for treating moist pulverulent material which comprises introducing the moist material into a container, applying a vacuum of less than 5 psi absolute to the container to evaporate the water from the material, vibrating the container while the vacuum is being applied thereto, returning the

pressure in the container to atmospheric, removing material from the container, refilling the container with moistened



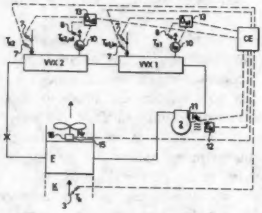
material and again applying a vacuum to the container to reduce the pressure therein to less than 5 psi absolute.

4,611,470

METHOD PRIMARILY FOR PERFORMANCE CONTROL AT HEAT PUMPS OR REFRIGERATING INSTALLATIONS AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Henrik S. Enström, Fyndevägen 5, 191 47 Sollentuna, Sweden

Filed Oct. 18, 1984, Ser. No. 662,031
Int. Cl.[4] G01K *13/00*
U.S. Cl. 62—127 22 Claims



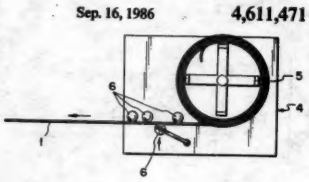
1. A method of primarily testing and performance control of heat pumps, refrigerating installations or corresponding systems, in which system thermal energy from at least one heat source is supplied to an energy-carrying medium such as a refrigerant, which circulates in the system and is advanced therein by at least one compressor and caused to pass through at least one condenser where thermal energy is emitted and exchanged to an energy-carrying medium such as a thermal sink, where the method includes the steps of determining actual values in the form of real performance of such parameters as thermal output and so-called coefficient of performance, against the background of measurements, and automatically and substantially continuously comparing said real performance values to nominal, ideal values representing corresponding expected performance values, characterized by the steps of determining said expected performance values, such as thermal output or refrigerating output ($Q_{1,f}$) and coefficient of thermal performance (COP_1) or coefficient of refrigerating performance (ϵ_f), automatically and substantially continuously based on actual operating conditions, which are substantially continuously determined by means of measurements.

4,611,471

ICE MAKING APPARATUS PARTICULARLY FOR AN ICE RINK

Kazuo Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Patine Shokai, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 691,269
Claims priority, application Japan, Mar. 2, 1984, 59-14812
Int. Cl.[4] F25C *3/02*
U.S. Cl. 62—235 11 Claims



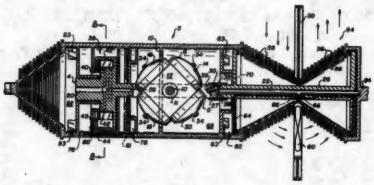
1. An ice making apparatus wherein a refrigerant including a liquefied gas such as freon or ammonia, or an anti-freeze liquid such as brine or ethylene glycol is circulated through a freezing pipe laid in a given area for forming an ice layer in said area, the freezing pipe being capable of being wound or extended under pressure in the longitudinal direction and is formed as an elongated soft steel pipe comprising an iron material containing very little impurity and having a coating of synthetic material at least on the outer surface of the pipe.

4,611,472

HEAT PUMP EQUIPMENT

Peter C. Lum, 80 Bonnymuir Drive, West Vancouver, British Columbia, Canada V7S 1L2

Filed Oct. 16, 1985, Ser. No. 788,056
Int. Cl.[4] F25B *3/00*
U.S. Cl. 62—499 14 Claims

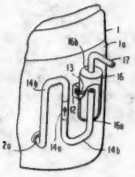


1. A heat exchange apparatus comprising:
an external rotor;
an internal stator hermetically sealed within the rotor;
an inertia device attached to the stator and able to resist movement of the stator so that a difference in speed between the stator and the rotor can be maintained on rotation of the rotor;
a refrigerant;
a rotary compressor for the refrigerant comprising a core attached to the stator, a wheel surrounding the stator, vanes mounted on the wheel and able to move with the rotor, a cylinder, eccentric to the vanes and attached to the stator, and oil able to form a liquid piston on rotation whereby relative rotation of the vanes and the cylinder compresses refrigerant as the volume between the wheel and the liquid piston decreases;
a condenser for the compressed refrigerant;
an evaporator to evaporate condensed refrigerant;
means to return evaporated refrigerant to the compressor; and
means to separate oil and maintain oil level for the liquid piston.

4,611,473
REFRIGERATION SYSTEM WITH INTEGRAL CHECK VALVE

Fumio Wada; Koji Ishijima; Fumiaki Sano, and Kazutomo Asami, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1985, Ser. No. 765,091
Claims priority, application Japan, Aug. 17, 1984, 59-171277
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—503 6 Claims



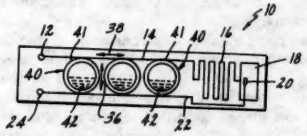
1. A refrigeration system including a check valve and an accumulator (16) connected together in series in a coolant fluid flow path at a suction inlet (2*a*) of a coolant fluid compressor (1), characterized by:

the check valve (14*a*) being inserted and sealingly mounted directly within a continuous and uninterrupted section of coolant fluid tubing (14*b*) to avoid potentially rupturable brazing connections between coolant fluid tubing sections and the check valve, wherein the check valve includes a stationary body member (24) sealingly fixed within said tubing section by a continuous circumferential crimp.

4,611,474
MICROMINIATURE REFRIGERATOR

Donald L. Musinski, Saline, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed May 14, 1984, Ser. No. 610,322
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R 9 Claims



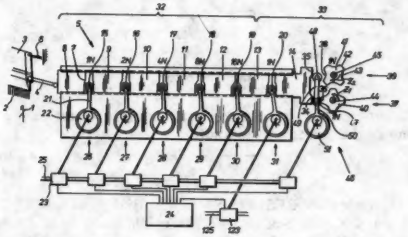
8. In a microminiature refrigerator which comprises a laminate assembly including a flat rectangular first plate having a first plurality of laterally spaced parallel channels extending longitudinally along one face thereof, a flat rectangular second plate having a second plurality of laterally spaced parallel channels extending longitudinally along a face thereof opposed to said one face, with said channels in said first plate being arranged in opposed pairs with said channels in said second plate, a flat rectangular third plate separating said first and second plates from each other, means at one longitudinal end of said plates forming refrigerant inlet and outlet means, and means at an opposing longitudinal end of said plates forming a refrigeration chamber in fluid communication with said channels through said third plate,

the improvement comprising a plurality of discrete heat conductive means carried by said third plate and extending between opposed pairs of said channels for heat-transfer contact with refrigerant passing therethrough, said plurality of discrete heat conductive means being separated from each other in the longitudinal direction of said third plate.

4,611,475
APPARATUS FOR THE CONTROL OF THE DISPLACEMENT OF A GUIDE BAR OF A WARP KNITTING MACHINE OR THE LIKE

Gerhard Bergmann, Heusenstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 796,874
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442090
Int. Cl.[4] D04B *23/00*
U.S. Cl. 66—207 10 Claims



1. An arrangement for the control of the shogging movement of a guide bar of a warp knitting machine or the like, comprising:

a plurality of steering devices coupled to said guide bar, said devices being reciprocatable to cause underlap displacement and overlap displacement of said guide bar;

summation drive means for moving, during the work cycle, said steering devices for initiating the underlap displacement and the overlap displacement in a timely, appropriate manner, said summation drive means having underlap displacement control means for moving said steering devices for underlap movements;

a first and a second overlap displacement control means, each being operable in opposing directions and operable simultaneously with said underlap control means; and

switching means operable to couple selectively one of either the first or second overlap control displacement means to said summing drive.

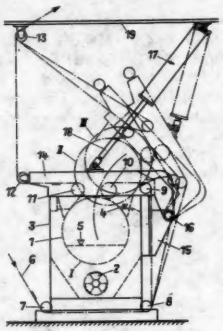
4,611,476
APPARATUS FOR THE CONTINUOUS WASHING OF LENGTHS OF TEXTILE MATERIAL

Gerold Fleissner, Chur, Switzerland, assignor to Vepa Aktiengesellschaft, Switzerland

Filed Nov. 28, 1984, Ser. No. 675,952
Int. Cl.[4] D06B *5/08*
U.S. Cl. 68—158 3 Claims

1. An apparatus for the continuous washing of a length of textile material which comprises a vessel containing a liquid for washing and textile material; a sieve drum, looped about by the textile material, arranged below a liquid level in said vessel; a stationary support means; a transverse pivotally mounted on said support means; said sieve drum being rotatably supported by said traverse and being movable from an operative position within the vessel to an inoperative position out of the vessel upon swinging of said traverse about the support means; feeding and take-off rollers operatively associated with the sieve drum for, respectively, feeding the length of textile material onto and for taking off the textile material from the sieve drum, said rollers being supported on said traverse; and pump means for maintaining the liquid level within said vessel; said traverse being movable to an incline position whereby the sieve drum is

arranged above the liquid level whereby a leader portion of the textile material guided by said rollers will not contact the



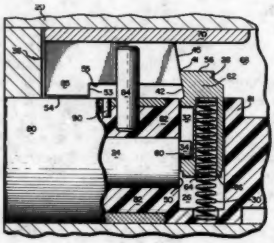
liquid and thereby avoid contaminating the liquid during feeding of the leader portion onto said sieve drum.

4,611,477

TAMPER RESISTANT LOCK BOLT ASSEMBLY

Allan B. Crites, Elk Grove Village, Ill., assignor to David Arlasky, Northbrook, Ill.

Filed Jul. 2, 1984, Ser. No. 627,077
Int. Cl.[4] E05B *63/00*
U.S. Cl. 70—416 **7 Claims**



1. A reciprocating cylinder lock mechanism comprising:

a tubular sleeve consisting of a first sleeve portion with a first external diameter having a cavity therein extending transverse to the axis of said sleeve contiguous with a sleeve extension having a second external diameter less than said first diameter; and a second sleeve portion which overlaps said extension and has a diameter approximately equal to said first external diameter;

means mounting said sleeve for axial movement between a retracted, locked position and an extended, unlocked position;

means normally urging said sleeve toward said extended position;

a bolt;

means mounting said bolt for movement through said cavity along a linear path transverse to the axis of said sleeve, between a retracted, unlocked position and an extended, locked position;

means normally urging said bolt toward said extended, locked position;

a bolt keeper comprising means for engaging said bolt when the bolt is in its retracted, unlocked position and when the bolt is in its extended, locked position;

a rotatable locking shaft within said sleeve;

means responsive to the rotation of said shaft for retracting said bolt from its extended, locked position; and

a fixed projection adjacent to said sleeve cavity and extending outwardly from said first sleeve portion extension through said overlapping second sleeve portion in a direction parallel to the linear path of said bolt; and

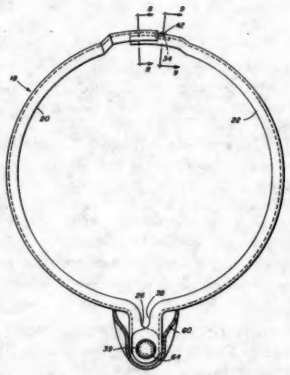
means on said keeper cooperating with said projection for preventing lateral movement of said projection and rotational movement of said sleeve when said sleeve is in said retracted, locked position to increase the resistance of said second sleeve portion to dislodgement from its association with said first sleeve portion by physical tampering with said lock mechanism.

4,611,478

LOCKING RING ASSEMBLY

John H. Carlson, West Boylston, and Anthony J. Agbay, Auburn, both of Mass., assignors to Omco Inc., Holden, Mass.

Filed Aug. 31, 1984, Ser. No. 646,233
Int. Cl.[4] G01R *11/04*; E05B *73/00*
U.S. Cl. 70—164 **12 Claims**



1. For use with an electric meter having a flanged meter receptacle holding the meter works and a flanged glass bowl covering the meter works, a locking ring assembly for locking the glass bowl to the meter receptacle, the locking ring assembly comprising:

(a) a two-piece locking ring consisting of two substantially semicircular sections, one of said sections having a hinge fitting at one end and the other of said sections having a mating hinge fitting at one end, said hinge fittings being sized and shaped and fitted together in a hinged arrangement to form a substantially circular locking ring which is configured to clamp the glass bowl flange to the meter receptacle flange;

(b) a radially extending leg at the other end of each said section, each said leg being formed with an opening, said legs being initially manually separated and then manually squeezed together so that said openings in said legs become axially aligned during positioning and fastening of said locking ring over the flanges of the glass bowl and the meter receptacle, a pulling force being exerted on said hinge fittings when said legs are squeezed together, said glass bowl being clamped to the meter receptacle when said legs are squeezed together;

(c) lockable shielding means enclosing said legs and securely shielding said legs from unauthorized access;

(d) one said hinge fitting being a male fitting having an enlarged body and a narrow tongue, and the other said hinge fitting being a female fitting having a transverse slot sized and shaped to tightly receive said narrow tongue; and

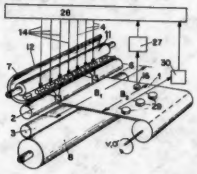
(e) said male hinge fitting narrow tongue having an upwardly protruding dimple, said female hinge fitting hav-

ing an upwardly protruding transverse depression, said dimple and said depression being positioned to mate when said fittings are interconnected.

4,611,479
METHOD AND APPARATUS FOR ROLLING METAL FOILS

Heinz Güttinger, Schaffhausen, Switzerland, assignor to Sulzer-Escher Wyss Limited, Zürich, Switzerland

Filed Nov. 26, 1984, Ser. No. 675,075
Claims priority, application Switzerland, Feb. 6, 1984, 532/84
Int. Cl.[4] B21B *37/02, 31/16*
U.S. Cl. 72—16 8 Claims



1. A method for rolling metal foils, especially aluminum foils, comprising the steps of:

conducting a sheet of material of a predetermined width between two work rolls pressed together with a predetermined line force at a predetermined sheet speed for reducing the thickness of said sheet of material from an initial value to a final value;

selecting said predetermined sheet speed of said sheet of material and said predetermined line force of said work rolls such that said predetermined line force lies below a region in which a thickness reduction of the sheet of material at a given sheet speed is independent of small variations in said line force;

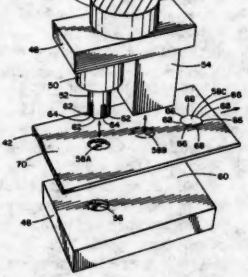
said line force varying over the width of said work rolls; and

adjusting said line force such that said thickness reduction of the sheet of material has a predetermined profile over the width of said sheet of material.

4,611,480
METALLIC WALL HAVING KNOCKOUTS AND METHOD OF FORMING

Charles A. Willetts, East Hazel Crest, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Apr. 12, 1984, Ser. No. 599,490
Int. Cl.[4] B21D *31/02*
U.S. Cl. 72—326 2 Claims



1. A method of fabricating, from flat strip steel, galvanized tubing having a plurality of spaced knockout portions adapted for selective removal by the application of force to the portion to be removed, such as by applying a sharp blow to that portion, said method comprising the following steps:

forming the knockout portions in said flat strip, each portion being defined, at least partially, by a plurality of lines of cleavage so that each knockout portion is attached to surrounding material by tab means, the forming step being carried out so that the passage of a fluid between the knockout portions and the remainder of said strip is precluded;

transversely bending said strip until the lateral ends thereof abut;

continuously welding said lateral ends together to form a tube;

applying liquids to the outside surface of said tube to remove contaminants therefrom;

rinsing the outside surface of said tube with water;

drying the outside surface of said tube; and

galvanizing the outside surface of said tube by passing said tube through a molten zinc bath, said step of forming knockout portions comprising the following substeps:

striking said flat strip steel with cutting punch means for forming in said strip a plurality of lines of cleavage at least partially defining a knockout portion;

displacing said portion, at least partially, from the remainder of said strip;

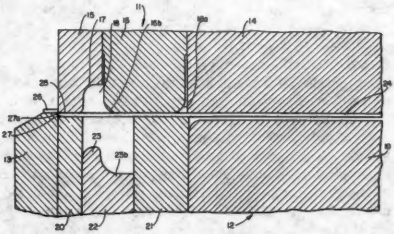
applying sufficient forces to opposing surfaces of said knockout portion and said strip to move said knockout portion toward said strip and to close any opening therebetween to prevent the passage of a fluid between said knockout portion and said remainder of said strip; and

repeating the aforementioned steps of striking, displacing and applying until formation of the desired number of knockout portions is completed, said steps of bending, welding, application of liquids, rinsing, drying and galvanizing being performed in a continuous rolling mill production line, said step of forming the knockout portions being completed off said production line with the strip being coiled after said forming step.

4,611,481
METAL CONTAINER END DIE

Charles S. Radtke, 37 Beech St., Little Ferry, N.J. 07643

Filed Dec. 2, 1985, Ser. No. 803,154
Int. Cl.[4] B21D *45/00*
U.S. Cl. 72—347 5 Claims



1. A die for producing a container end from sheet material comprising:

(a) an upper punch section comprising a hard ring having inner and outer rounded lower corners and a punch cut edge having an upwardly extending curvilinear female profile in the lower inner portion thereof forming an annular gap between said punch cut edge and said hard ring; and

(b) a lower die section comprising an inner die, a first upwardly biased draw ring movably mounted outwardly of said die and in contacting relationship with said punch cut edge; a second draw ring mounted adjacent said inner die

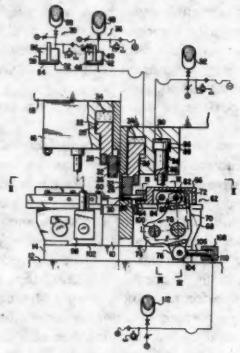
and in contacting relationship with said hard ring; and a fixed wipe-up ring located between said first and second draw rings, the upper portion of said wipe-up ring having a male profile matable with said female profile of said punch cut edge in said annular gap and having a downwardly curved inner portion which is matably engagable with said outer corner of said hard ring.

4,611,482

CLOSED DIE FORGING APPARATUS

Hirofumi Hara, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,271
Claims priority, application Japan, Aug. 2, 1983, 58-124466; Aug. 2, 1983, 58-124467
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—354 8 Claims



1. In a closed die forging apparatus, in combination:

(a) a fixed bottom die;

(b) a ram disposed above the bottom die for up and down motion relative to the same;

(c) a top die carrier rigidly mounted to the underside of the ram and having a hollow defined therein;

(d) a piston slidably engaged in the hollow in the top die carrier for up and down motion relative to the top die carrier and pressure tightly defining thereover a fluid chamber to be filled with fluid;

(e) a piston rod directed downwardly from the piston and slidably extending through the top die carrier;

(f) a top die formed at the bottom end of the piston rod for movement therewith into and out of contact with the bottom die with the up and down motion of the ram, the top and bottom dies defining in combination a die cavity in which a workpiece is to be forged into a desired shape;

(g) low pressure accumulator means for storing the energy of the fluid in the fluid chamber in the top die carrier as the fluid is pressurized by the piston to a comparatively small extent upon continued descent of the ram after the top die has been thereby moved into contact with the bottom die, the low pressure accumulator means comprising a first pressure tight vessel having a floating piston mounted therein to divide the interior thereof into a pair of opposed fluid chambers, one of the fluid chambers of the first vessel being in communication with the fluid chamber in the top die carrier, and a first accumulator in communication with the other of the fluid chambers of the first vessel; and

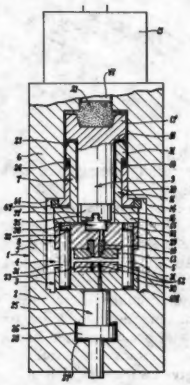
(h) high pressure accumulator means for storing the energy of the fluid in the fluid chamber in the top die carrier as the fluid is pressurized to a greater extent upon continued descent of the ram after the top die has been thereby moved into contact with the bottom die, the high pressure accumulator means comprising a second pressure tight vessel having a floating piston mounted therein to divide the interior thereof into a pair of opposed fluid chambers, one of the fluid chambers of the second vessel being in communication with the fluid chamber in the top die carrier, and a second accumulator in communication with the fluid chambers of the second vessel.

4,611,483

PRESS AND METHOD OF MAKING SAME

Bernard M. Hadaway, Highett, Australia, assignor to REPCO Limited, Australia

Filed Jun. 18, 1984, Ser. No. 621,544
Claims priority, application Australia, Jun. 28, 1983, PG0024
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—453.02 32 Claims

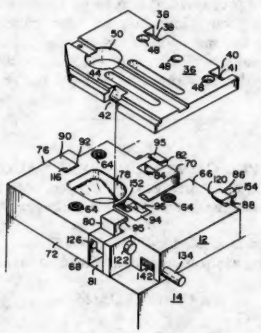


1. A metal working press including, base, a cylinder supported above said base, a working ram assembly axially movable towards and away from the base and comprising a primary ram and a secondary ram which are arranged substantially coaxial and are movable axially relative to one another, said secondary ram is slidable axially within said cylinder and said primary ram is slidable axially within an axial bore of the secondary ram, a die set located between said base and said ram assembly and being removable from the press to enable replacement by another said die set, said die set including upper and lower die assemblies and means interconnecting those die assemblies so that they are movable towards and away from each other in the axial direction of said ram assembly, said upper die assembly including two die members which are relatively movable in said axial direction and each of which is arranged to be driven towards said base through a working stroke by a respective one of said rams, connecting means including cooperable parts of said primary ram and said upper die assembly which operates to prevent separation of said ram assembly and said die set in said axial direction but allows such separation in a direction transverse to said axial direction so that the die set can be moved into and out of the press in said transverse direction, means releasably retaining said die set against said transverse separation, and three pressure chambers provided within said cylinder, one said chamber is a high pressure chamber and the end of said primary ram remote from said die set is exposed to that chamber, another said chamber is a set and strip chamber and opposed surfaces of said primary and secondary rams which extend transverse to said axial direction are exposed to that chamber, the other said chamber is a die open chamber and a surface of said secondary ram which faces in the opposite direction to said opposed surface thereof is exposed to that chabmer, and said set and strip chamber is located between the other two said chambers.

4,611,484
QUICK CHANGE MOUNTING PLATE

William M. Kissinger, Jr., Carlisle, and Howard C. Phillips, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 10, 1984, Ser. No. 680,210
Int. Cl.[4] B21D *37/04*
U.S. Cl. 72—481 6 Claims



1. A quick change mounting plate adapted to be secured to a bed of a press, the mounting plate comprising:

a first surface to which base plates of respective end fed and side fed electrical terminal applicators are selectively lockable for operation by the press;

a second surface opposite to said first surface, for engagement with the press bed;

a first latch on one side of said first surface for engaging one edge of the base plate of said end fed applicator;

a second latch on the opposite side of said first surface for engaging the opposite edge of the base plate of said end fed applicator;

a third latch at a third side of said first surface for engaging one edge of the base plate of said side fed applicator; and

a fourth latch disposed substantially centrally of said first surface for engaging the opposite edge of the base plate of said side fed applicator;

each latch being actuable manually, to move it between a raised position for engaging the respective edge of the respective base plate and a lowered position in which said first surface is uninterrupted by said latch, said fourth latch being provided with means for locking it in both its raised and its lowered positions and being urged towards its raised position by resilient means, the locking means being releasable to allow the resilient means to move said fourth latch from its raised to its lowered position with a snap action,

said fourth latch being mounted for pivotal movement between its raised and its lowered positions and being urged towards its raised position by means of a spring, said locking means comprising a shaft which is slidable in a bore in the mounting plate and which carries a locking member, the shaft being movable manually between a first position in which the locking member engages beneath said fourth latch in both its lowered and its raised positions and a second position in which the locking member is clear of said fourth latch.

4,611,485
HIGH PRESSURE PIPE STOPPER

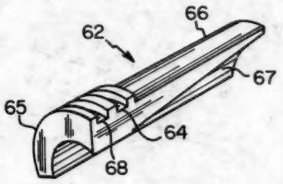
Bruce E. Leslie, Baden, Pa., assignor to Thaxton, Inc., Gibsonia, Pa.

Filed Dec. 3, 1984, Ser. No. 677,208
Int. Cl.[4] F16L *55/10*; G01M *3/02*
U.S. Cl. 73—49.8 15 Claims

1. A high pressure pipe stopper for insertion into the interior of a pipe to be tested and into contact with the inner surface of the pipe comprising:

(a) an elongated stem having a threaded section and terminating at a first end in a conical shaped mandrel, said mandrel having an exterior surface sloped at an angle of about 5°;

(b) a plurality of grip segments arranged in cylindrical form about the stem, each of said grip segments having a substantially smooth outer surface and having an inner surface complementary in shape to the exterior surface of the mandrel and in sliding engagement therewith;



(c) a nut for threadably engaging the threaded section of the stem and engagably forcing the grip segments to move upward along the mandrel; and

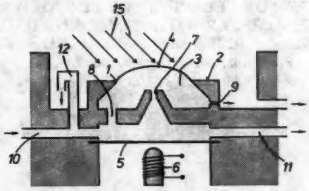
(d) an extractor coupling connected between and in engagement with said nut and said grip segments;

whereby turning of the nut toward the mandrel causes the grip segments to diverge outwardly and engage the inner surface of the pipe to securely fasten the pipe stopper therein and whereby turning of the nut away from the mandrel causes the grip segments to be drawn down the mandrel and away from the inner surface of the pipe.

4,611,486
METHOD AND APPARATUS FOR MEASURING AND/OR MONITORING THE SURFACE TENSION OF A FLUID

Norbert Stockhausen, Munich, Fed. Rep. of Germany, assignor to Fogra Deutesche Forschungsgesselschaft fur Druck-und Reproduktionstechnik e.v., Munich, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 708,357
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410778
Int. Cl.[4] G01N *13/02*
U.S. Cl. 73—64.4 19 Claims



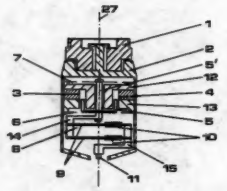
9. Apparatus for use in measuring or monitoring the surface tension of a fluid comprising a vessel having a fluid chamber therein, said chamber having a circular opening at its upper end; means for delivering fluid to said chamber in an amount to cause its upper surface to assume a convex curvture and extend through said opening; means for producing standing capillary waves on said surface; means for illuminating said surface with light for reflection from said surface; means for receiving light reflected from said surface; means responsive to the reception of said reflected light for generating an electrical signal having a range of frequencies proportional to the intensity of the reflected light; and means for measuring the intensity of said reflected light within a selected frequency range.

4,611,487

MICRO HARDNESS TESTING DEVICE

Manfred Krenn, Feldkirchen; Gerhard Raffer, Graz; Alfred Wagendristel, Perchtoldsdorf, and Herwig Bangert, Vienna, all of Austria, assignors to Anton Paar, KG, Graz; Herwig Bangert, Vienna and Alfred Wagendristel, Perchtoldsdorf, all of, Austria

Filed Mar. 15, 1985, Ser. No. 711,889
Claims priority, application Austria, Mar. 16, 1984, 894/84
Int. Cl.[4] G01N *3/42*
U.S. Cl. 73—81 24 Claims



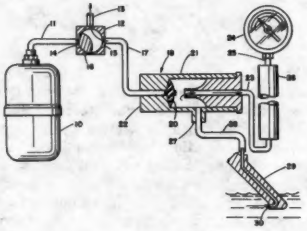
1. Micro hardness testing device (durometer) comprising
permanent magnet means having a plunger;
spring arrangement means having at least one strain gauge that provides a signal on bending of the spring arrangement, wherein the spring arrangement is carried by the plunger;
a penetration body loadable via the spring arrangement means;
means for connecting the plunger to a current supply;
means for converting the strain gauge signal to an electrical signal as a measuring signal for force applied to the penetration body;
means for supplying the measuring signal to an evaluation unit;
wherein the plunger, the permanent magnet means and spring arrangement means are enclosed by a housing adapted for insertion into a revolvable nose piece of a microscope;
and wherein the housing approximates shape and dimensions of an objective insert for the microscope;
and further wherein the penetration body is adjustable in an optical axis of a microscope.

4,611,488

APPARATUS FOR CLEARING THE LINE OF A MARINE SPEEDOMETER WITH PRESSURIZED GAS

Mark H. Weingart, 1525 Streets Boro, Plaza, Ohio 44240

Filed Apr. 29, 1985, Ser. No. 728,388
Int. Cl.[4] G01C *21/10*; G01F *1/46*
U.S. Cl. 73—182 3 Claims



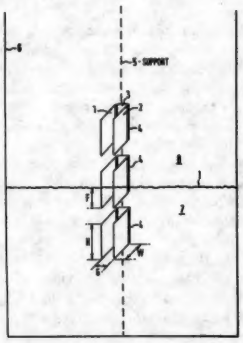
1. An apparatus for clearing the line of a marine speedometer with pressurized gas comprising the following:
(a) a speedometer readout of the pitot tube type;
(b) a pitot tube interconnected with said speedometer readout;
(c) a diverter valve including a diaphragm having a connection between said speedometer readout and said pitot tube;
(d) a source of pressurized gas; and
(e) a three way valve between said source of pressurized gas and diverter valve, having an exhaust port in the connection from the source of gas to the diverter valve,
whereby the pressurized gas may be connected through the diverter valve into the pitot tube to clear the tube from obstructions; upon turning off the pressurized gas diverter valve will normally recover, because of the design of the diaphragm, to activate the speedometer readout.

4,611,489

U-SHAPED CAPACITOR LEVEL GAUGE

Klaas Spaargaren, and Adrianus C. W. Leyen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,652
Claims priority, application United Kingdom, Jan. 17, 1984, 8401221
Int. Cl.[4] G01F *23/26*
U.S. Cl. 73—304 C 13 Claims



1. Apparatus for determining the position of an interface between different fluids, comprising:
at least one cell means, said cell means having first, second and third electrically conductive members vertically isolated from and insulatingly disposed adjacent each other with said third member proximate a vertical edge of both said first and second members;
signal generating means interconnected with said first member;
signal detecting means interconnected with said second member; and
zero potential means interconnected with said third member.

4,611,490

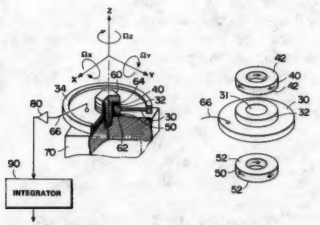
ANGULAR ACCELERATION SENSOR

Kiyoshi Takeuchi, University Park, Pa., assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 26, 1984, Ser. No. 654,389
Claims priority, application Japan, Sep. 29, 1983, 58-179333
Int. Cl.[4] G01P *15/09*
U.S. Cl. 73—505 18 Claims

1. A device to measure angular acceleration about a predefined axis, the device comprising:
a weight which has a shape symmetrical with respect to an axis;
transducer means for converting mechanical stress into an

angular acceleration representing signal, said transducer means being attached to said weight with said axis as the center axis of a resultant assembly, and said transducer means having directional sensitivity to shear stress in a circumferential direction about said axis; and



a base member to which said assembly is fixed with said transducer means between a surface of said weight and a surface associated with said base member and sensitive to shear stress between said surfaces and such that said center axis of said assembly can be brought into agreement with said predefined axis and that at least a major portion of said wight is spaced from said base member.

4,611,491

ACCELEROMETER SYSTEM

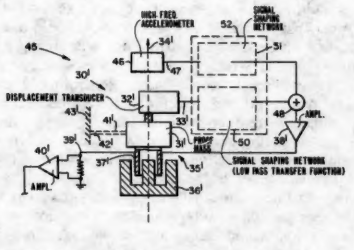
Kenneth R. Brown, Kirknewton, and Norman F. Watson, South Queensferry, both of Scotland, assignors to Ferranti plc, England

Filed Apr. 19, 1985, Ser. No. 724,923

Claims priority, application United Kingdom, May 5, 1984, 84 11578

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—517 B **10 Claims**



1. A single axis accelerometer system comprising

(i) a low frequency accelerometer of the force feedback type including an inertial proof mass mounted to be displaced from a datum position along a sensitive axis by an acceleration force, a displacement transducer operable to produce a feedback signal as a function of displacement of the proof mass from the datum position and capture means responsive to a capture current flowing therein to produce a restoring force on the proof mass to balance the acceleration force, said capture current being provided as a function of the feedback signal,

(ii) a high frequency accelerometer fixed in relation to the low frequency accelerometer and responsive to high frequency vibrations along said sensitive axis to produce an acceleration related signal, and

(iii) signal processing means operable to mix the feedback signal from the proof mass displacement transducer and acceleration related signal produced by the high frequency accelerometer and derive therefrom the capture current.

4,611,492

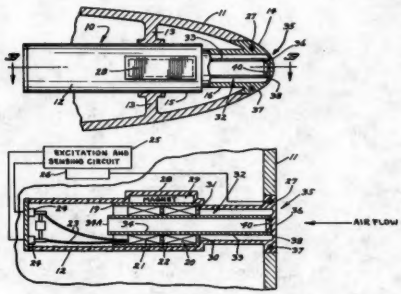
MEMBRANE TYPE NON-INTRUSIVE ICE DETECTOR

Mark R. Koosmann, Corcoran, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed May 3, 1984, Ser. No. 606,663

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—579 **8 Claims**



1. An ice detector adapted for mounting on a wall having a curved outer surface, said ice detector comprising a disphragm member adapted to be exposed with such wall to an air stream in which ice is to be detected, said diaphragm member having a center portion, an outer edge support portion, and a flexible wall portion extending between the outer edge support portion and the center portion, said flexible wall portion permitting deflecting movement of the center portion in direction generally normal to the diaphragm member; the diaphragm member being curved to form a smooth continuation of the curved outer surface of a wall on which the diaphragm member is mounted, means connected to the center portion of the diaphragm member to vibrate the center portion and having a mass that is selected to cause the natural frequency of vibration of the means to vibrate and the connected center portion of the diaphragm member to be dependent upon the flexibility of said flexible wall portion between the center portion and the outer edge support portion of said diaphragm member; and means to sense changes in natural frequency of said means to vibrate upon change in flexibility of the flexible wall portion due to stiffness of ice accumulating on said diaphragm member.

4,611,493

PROCESS AND APPARATUS FOR EXECUTING A PLURALITY OF MUTUALLY COMPLEMENTARY MICROSCOPIC INVESTIGATIONS

Karl-Heinz Muth, Lollar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,220

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335480

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—606 **20 Claims**

1. A process for carrying out a plurality of mutually complementary microscopic investigations of a stationary object comprising:

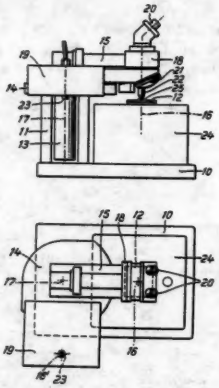
producing first and second beams of radiation, said second beam differing from said first beam;

focusing said first and second beams on the object to be investigated;

scanning the object being investigated in a grid pattern in two mutually perpendicular directions, said scanning

being effected by moving the source of one of said beams of radiation while maintaining the object being investigated and the source of the other beam of radiation stationary; and

visibly displaying the results of the investigations.



4,611,494

ULTRASONIC IMAGING APPARATUS USING DIGITAL CONTROL

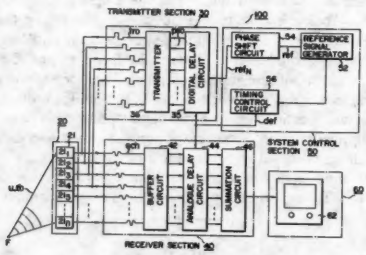
Susumu Uchiyama, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 8, 1984, Ser. No. 669,329

Claims priority, application Japan, Nov. 10, 1983, 58-211262

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—626 **4 Claims**



1. An ultrasonic imaging apparatus comprising:

transducer means having a plurality of transducer elements for transmitting ultrasonic pulses along a beam to an object and receiving ultrasonic echoes from the object to produce echo signals;

transmitter means for exciting said elements at different delayed timings to steer or focus said beam, said transmitter means including a clock pulse generator for generating a train of clock pulses;

phase-shifting means for shifting the phase of the train of clock pulses generated by the clock pulse generator of said transmitter means, thereby producing a plurality of reference pulse trains having different phases;

clock pulse selector for independently selecting one of said reference pulse trains, the phase difference in time of which is the nearest to the remainder of said delayed timing divided by the period of the clock pulse;

a plurality of pulse counters connected to said pulse selectors for counting the reference pulse trains selected by said pulse selectors until reaching the preset value nearest to said delayed timing to produce a trigger pulse;

pulsers connected to said transducer elements and said pulse counters for producing, in response to the trigger pulse, a drive pulse to excite the transducer elements;

scanning means for achieving a two-dimensional scanning of the object by using said beam;

receiving means connected to said transducer means for processing the echo signals to produce a video signal representing the image of the object; and

display means for displaying the image of the object by using the video signal.

4,611,495

ULTRASONIC TESTING

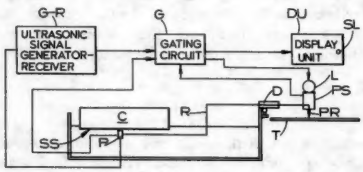
Peter J. Emerson, Alcester, England, assignor to BCIRA, Birmingham, England

Filed Sep. 5, 1984, Ser. No. 647,435

Claims priority, application United Kingdom, Sep. 8, 1983, 8324109

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—634 **13 Claims**



1. Apparatus for the ultrasonic testing of a casting or other body for defects comprising an ultrasonic probe which is arranged in use to scan a surface of the casting or other body, a drawing or a template that represents the area of the surface of the casting or other body to be scanned by said probe, a pointer that is movable by an operator over said drawing or template, a linkage which interconnects said probe with said pointer in such a manner that as said pointer is moved over said drawing or template said probe scans the surface of the casting and each position of said probe is represented by a corresponding position of said pointer, ultrasonic signal generating-receiving means connected to said probe, gating means connected to said ultrasonic signal generating-receiving means, display means connected to said gating means and responsive to signals from said ultrasonic signal generating-receiving means for indicating when a defect is detected in the casting or other body by said probe, and proximity sensing means associated with said pointer for sensing when said pointer is in the area of said drawing or template and connected to said gating means, whereby said gating means prevents the passage of signals from said ultrasonic signal generating-receiving means to said display means except when said pointer is in the area of said drawing or template.

4,611,496

ULTRASONIC FLOW METER

Taichi Komachi, Tokyo, Japan, assignor to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 632,045

Claims priority, application Japan, Jul. 27, 1983, 58-137011; Jul. 27, 1983, 58-137012

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.27 **4 Claims**

1. An ultrasonic flowmeter for measuring flow along a fluid flow path having a center thereof comprising:

first ultrasonic transducer means for emitting an ultrasonic wave for transmission in the fluid flowing in the path;

second ultrasonic transducer means for receiving said ultra-

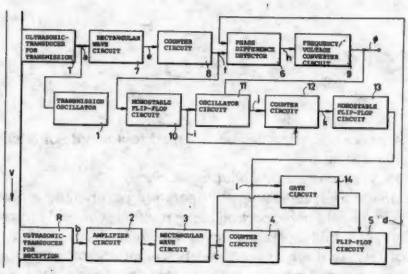
sonic wave propagated in said fluid along the path and producing a reception signal indicative thereof, wherein a line drawn between said first and second transducer means does not cross directly through the center of said fluid flow path;

transmission oscillator means for generating a drive signal to drive said first ultrasonic transducer means for transmission;

first counter means for frequency dividing said drive signal generated by said transmission oscillator means;

second counter means synchronized with said transmission oscillator for frequency dividing the reception signal received by said second ultrasonic transducer means to develop an output signal thereof;

phase difference detection means for detecting the phase



difference between the drive signal generated by said transmission oscillator means and the reception signal from said second ultrasonic transducer means and developing an output, wherein both the signals are synchronized and frequency divided by said first and second counter means with the said dividing ratio;

frequency/voltage converter means for converting the output of said phase difference detection means into an analog signal corresponding to the flow rate of said fluid;

an oscillator oscillating with a frequency proportional to said analog signal and producing an output;

third counter means for counting the output of said oscillator up to a predetermined number;

monostable flip-flop means, triggered by an output signal of said third counter means for resetting said second counter means.

4,611,497

FORCE TRANSDUCER

Walter Knabel, Murnau, and Gerd Klubitschko, Oberau, both of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah

PCT No. PCT/EP83/00059, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03561, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 3, 1983, Ser. No. 667,878

Int. Cl.[4] G01L *1/18;* H01L *10/10*

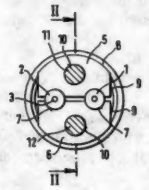
U.S. Cl. 73—862.68 **18 Claims**

1. A transducer for electrically responding to external forces and/or torques applied to said transducer, said transducer comprising:

force-variable impedance means for changing impedance in response to applied external forces;

force transmitting means bearing about the periphery of said impedance means for transmitting forces applied to said transducer to said impedance means, said force transmitting means bearing on said impedance means and having a cross-section with at least a partially curved periphery; and

retaining means disposed about the periphery of said force transmitting means, said retaining means having a curved inner surface bearing on the curved periphery of said force transmitting means for retaining said force transmitting means in bearing relationship with said impedance means.



4,611,498

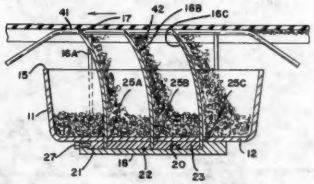
COLLECTION RECEPTACLE AND METHOD

Richard P. Stahura, Indiana, Pa., assignor to Martin Engineering Company, Neponsit, Ill.

Filed Oct. 21, 1985, Ser. No. 789,375

Int. Cl.[4] G01N *1/08;* G01G *19/00*

U.S. Cl. 73—864.41 **6 Claims**



1. A receptacle for collecting and weighing the residue carried by a moving surface including a partially enclosed container, open at its upper end, defining a bottom surface and a side wall with an upper edge, one or more resilient blades extending upwardly from said bottom surface, each of said blades including a scraping edge at the upper end thereof and each blade extending to a height above said upper edge of said side wall when blade is in its unflexed state, and spacer means associated with and extending upwardly from said container, said spacer means defining an engaging surface positioned such that said engaging surface is above said upper edge of said container side wall but is below said scraping edge of said blade when said blade is in its unflexed, vertical position, whereby when said receptacle is urged toward a moving surface with sufficient force, said engaging surface of said spacer means will contact said moving surface, said resilient blade will flex until said scraping edge of said blade is at the same height as said engaging surface of said spacer means and said blade will scrape residue from said moving surface into said container.

4,611,499

ENGINE STARTER GEARING

Paul F. Giometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Jan. 30, 1984, Ser. No. 575,199

Int. Cl.[4] F02N *11/00*

U.S. Cl. 74—6 **13 Claims**

1. An engine starter gearing for selectively starting an engine having a starting gear, said engine starter gearing comprising:

a power shaft;

a sleeve slidably, but non-rotatably, secured to said power shaft, said sleeve having external helical splines formed on one extremity thereof;

a pinion gear slidably journalled to said power shaft for axial movement relative thereto, said pinion gear being adapted for movement into and out of engagement with said starting gear of said engine to be started;

a driven clutch member secured to said pinion gear for movement therewith;

a circular recess formed in said driven clutch member;

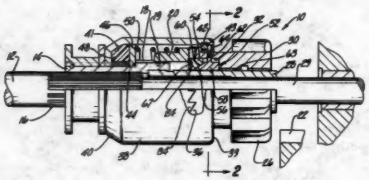
a driving clutch member slidably mounted on said helical splines of said sleeve, said driving and driven clutch members having complementary mutually engageable inclined teeth for transmitting torque therebetween in one direction of rotation;

a barrel housing having an open end, said barrel housing being slidably supported on said sleeve and spatially encompassing said driving and driven clutch members;

abutment means disposed within said barrel housing adjacent said open end thereof, said abutment means being adapted for engagement with said driven clutch member for confining said driving and driven clutch members within said barrel housing;

resilient means disposed within said barrel housing, said resilient means abutting said driving clutch member, said resilient means further biasing said driving and driven clutch members into mutual engagement;

a radially inwardly extending shoulder formed on said driving clutch member adjacent said circular recess of said driven clutch member;



an annular thrust washer loosely disposed in said circular recess, said annular thrust washer having an inner conical surface, said annular thrust washer being adapted to abut said radially inwardly extending shoulder of said driving clutch member when said annular thrust washer is displaced in a first axial direction;

a plurality of centrifugal flyweight members annularly arranged within said circular recess in said driven clutch member, said plurality of centrifugal flyweight members each having a base portion and a wedge portion extending from said base portion, said wedge portion further having an inclined surface abutting said conical surface of said annular thrust washer, said plurality of centrifugal flyweight members being operative to displace said annular thrust washer in said first axial direction in response to centrifugal force; and

a plurality of partial circular recesses formed in said driven clutch member, said plurality of partial circular recesses each extending from said circular recess of said driven clutch member, each of said partial circular recesses slidably receiving said base portion of an associated centrifugal flyweight member of said plurality of centrifugal flyweight members to prevent rotatable movement of said plurality of centrifugal flyweight members with respect to said pinion gear while permitting radial movement thereof.

4,611,500

BRAKE OPERATING DEVICE

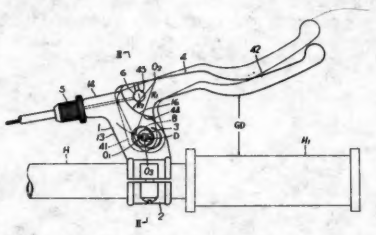
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 17, 1984, Ser. No. 682,313

Claims priority, application Japan, Dec. 29, 1983, 58-203723[U]

Int. Cl.[4] G05G *7/00;* F16C *3/28;* B62L *3/02*

U.S. Cl. 74—489 **6 Claims**



1. A brake operating device mounted to a handle of a bicycle, comprising:

a bracket having a first abutting surface,

an operating lever having an operating portion and a pivot portion, said pivot portion being pivoted swingably to said bracket, said operating lever having a second abutting surface abutting against said first abutting surface to restrict a grip dimension between said operating portion and said handle,

a pivoting means including a lever shaft for pivoting said operating lever relative to said bracket at a pivotal center, said first and second abutting surfaces each being formed in a shape of a circular arc centered at a position spaced with respect to said pivotal center of said pivoting means, and

an adjusting means enabling said pivotal center to shift on a circumference of a circle concentric with said circular arcs forming said first and second abutting surfaces, said adjusting means securing said pivoting means at a position on said circumference of said circle to which said pivotal center is shifted, thereby adjusting said grip dimension between said lever and said handle.

4,611,501

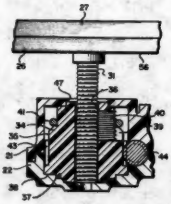
REMOTE CONTROL APPARATUS

William L. Brown, 17373 Roxbury, Southfield, Mich. 48075, assignor to William L. Brown, Novi, Mich.

Continuation of Ser. No. 459,512, Jan. 20, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 799,287

Int. Cl.[4] F16C *1/10;* F16H *1/18;* G02B *5/08*

U.S. Cl. 74—501 M **12 Claims**



1. In a remote control apparatus comprising a base member, a second member, means mounting said second member for pivotal movement, relative to said base member, about a pair of mutually transverse pivotal axes, and a pair of linkages between said base member and said second member, each of said

linkages comprising means actuable to pivot said second member about a respective one of said pivotal axes, the improvement wherein at least one of said linkages comprises:

a helical spring, extending between said base member and said second member, transverse to said pivotal axes;

said helical spring having a longitudinal axis and a terminal end for engagement with said second member;

means, comprising a bushing element and an externally threaded member, mounting said helical spring for axial movement relative to said base member to pivot said second member about one of its pivotal axes;

said terminal end of the helical spring being directly connected to said second member without an intervening mechanical linkage to accommodate the pivotal movement of the second member;

said helical spring comprising resilient means for permitting elastic bending of said helical spring in response to pivotal movement of said second member about either of its pivotal axes;

said helical spring having a substantially uniform diameter along its length between said base member and said terminal end;

the elastic bending properties of the helical spring constituting substantially the sole provision for accommodating said pivotal movement of the second member;

said bushing element having an exterior, an axis of rotation corresponding to the axis of said helical spring and an internal axial opening within which said helical spring extends;

means on said base member for seating said bushing element and mounting said bushing element for rotation about its axis;

said externally threaded member having an axis parallel to the axis of said helical spring;

means mounting said externally threaded member for revolving movement about the axis of said bushing element in response to axial rotation of said bushing element;

said externally threaded member being separate and discrete from said bushing element and being non-integral therewith;

said mounting means for the externally threaded member comprising a radially extending slot in said bushing element;

said slot defining an opening in the exterior of said bushing element and comprising means for receiving said externally threaded member therein;

said helical spring having a plurality of lap means defining external threading around the periphery of the helical spring;

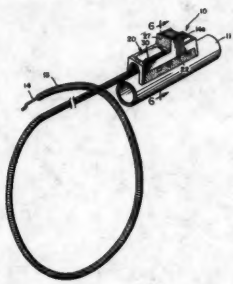
and means on said externally threaded member for threadedly engaging said external threading on said helical spring to move the helical spring axially in response to said revolving movement of the externally threaded member.

4,611,502
THROTTLE CONTROL ASSEMBLY

Ted W. Gregory, Libertyville, Ill., assignor to Arens Controls, Inc., Evanston, Ill.

Filed Oct. 11, 1985, Ser. No. 786,590
Int. Cl.[4] F16C *1/10;* G05G *5/06*
U.S. Cl. 74—502 **10 Claims**

1. A throttle control assembly for lawnmowers and other power-operated equipment, comprising a throttle control wire slidably carried in a flexible tubular casing with its ends projecting beyond the ends of said casing; a mounting member secured to one of said ends of said casing and having an undersurface adapted to be affixed to said equipment; said mounting member having generally parallel sides and a pair of longitudinal ribs projecting laterally from said sides with smooth, elongated, upper surfaces; and an elongated cover having integral top and side walls defining a downwardly-opening cavity for receiving said mounting member; said cover being substantially longer than said mounting member and said side walls thereof providing elongated downwardly-facing bearing surfaces within said cavity for slidably engaging the upper surfaces of said ribs; retention means formed integrally with said side walls of said cover for retaining said cover upon said mounting member; means provided by said cover for securing

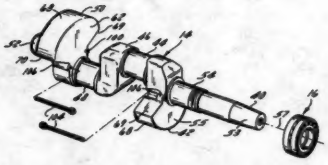


the same to a portion of said wire projecting from the end of said casing secured to said mounting member; and a knob provided by said cover to facilitate manually sliding said cover longitudinally into selected operating positions relative to said mounting member.

4,611,503
MEANS FOR REMOVING BEARING FROM CRANKSHAFT

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Dec. 24, 1984, Ser. No. 685,496
Int. Cl.[4] F16F *15/26;* F16C *3/08*
U.S. Cl. 74—603 **9 Claims**



9. In combination:

a crankshaft comprising:

a counterweight having opposite sides;

a shaft extending from one side of said counterweight along an axis of rotation,

said shaft having a bearing-receiving portion extending from said one side of said counterweight for a predetermined distance;

a crank pin extending from the opposite side of said counterweight along a pin axis which is parallel to and spaced from said axis of rotation;

and a link at an end of said crank pin;

a bearing means mounted on said shaft and comprising:

a bearing member having a hole therethrough in which said bearing-receiving portion is frictionally engaged,

said bearing member having an inner end surface disposed adjacent said one side of said counterweight;

and means for removing said bearing means from said shaft comprising:

a plurality of threaded screw-receiving holes extending through said counterweight, said holes having hole axes which are parallel to, spaced from and lie on different

sides of said axis of rotation, each hole being positioned so as to be aligned with said bearing member on said shaft;

and a screw for each of said screw-receiving holes,

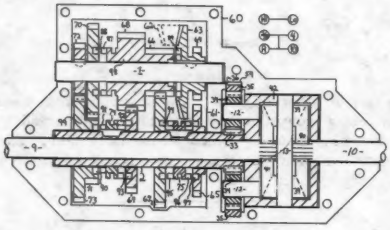
said screw being of sufficient length to ensure that said bearing assembly can be pushed completely off said bearing-receiving portion of said shaft whereat frictional engagement occurs, said screw being of a length which enables it to fit between said counterweight and said link.

4,611,504

GARDEN TRACTOR TRANSAXLE WITH PLANETARY DIFFERENTIAL INPUT

Kenneth P. Rundle, 8304 Brookside Rd., Independence, Ohio 44131

Filed Jul. 5, 1984, Ser. No. 628,204
Int. Cl.[4] F16H *37/08*
U.S. Cl. 74—695 **2 Claims**



1. In a transaxle (FIGS. 1 and 2): a housing, a mainshaft and a countershaft parallel thereto journalled in said housing, a plurality of toothed driving sets on said shafts for establishing a plurality of drives at respective ratios between said shafts comprised of, a first toothed driving element nonrotatable on said mainshaft, driving constantly a first toothed driven element rotatable on said countershaft, and a second toothed driving element rotatable in cluster with said first toothed driven element on said countershaft, said second toothed driving element constantly driving a second toothed driven element rotatable on said mainshaft, and a second cluster rotatable on said mainshaft having at least a third and a fourth toothed driving element drivingly connected constantly to at least a third and a fourth toothed driven element rotatable on said countershaft, first selective shift means to drivingly connect only one at a time said first, third and fourth toothed driven elements to said countershaft, second selective shift means to drivingly connect said second cluster to said mainshaft and to said second toothed driven element only one at a time, said transaxle being further comprised of a differential in said housing having an input carrier member, gear means to drivingly connect said input carrier and said countershaft, said differential having a pair of coaxial output axle shafts leaving said housing to drive tractive members.

4,611,505

VEHICULAR DIFFERENTIAL DRIVE ASSEMBLY AND MOUNTING MEANS THEREFOR

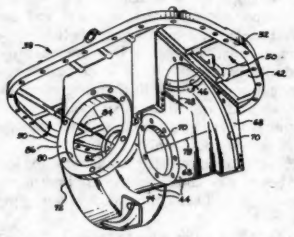
Michael G. Cronin, Peoria, and Perry G. Cruce, Marquette Heights, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 30, 1985, Ser. No. 781,612
Int. Cl.[4] F16H *37/06, 57/02*
U.S. Cl. 74—720.5 **23 Claims**

1. A differential drive assembly for a vehicle having a case defining an outwardly facing opening and a first mounting face peripherally about the opening, comprising:

a differential steering mechanism including a first input gear, a second input gear, and a plurality of interconnected and cooperating planetary gear elements driven by the input gears, two of the planetary gear elements serving as output elements and each being adapted to be driven at different speeds in response to rotation of the second input gear for steering the vehicle; and

mouting means for rotatably supporting the input gears and the planetary gear elements along a transverse central axis and for modularly positioning the differential steering



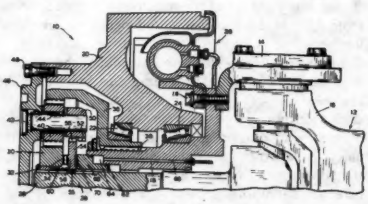
mechanism in a protected location within the opening of the case, the mounting means including a one-piece carrier body defining a second mounting face adapted to be releasably matingly connected to the first mounting face of the case.

4,611,506

HYDRAULICALLY ACTUATED PLANETARY WHEEL DRIVE

Paul B. Groothius, Niles, Mich., assignor to Clark Equipment Company, South Bend, Ind.

Filed Apr. 29, 1983, Ser. No. 490,077
Int. Cl.[4] F16H *3/44;* F16D *25/00*
U.S. Cl. 74—794 **11 Claims**



1. A wheel drive mechanism for an axle having a housing and a cantilever mounted spindle having an outward free end and a mounted inner end connected to the housing, comprising

a hub rotatably mounted on the spindle,

a shaft within the spindle extending beyond the outward end of the spindle,

the said shaft being rotatable about its axis but not movable axially,

a ring gear connected to said spindle,

at least one planet gear in mesh with said ring gear and carried on a carrier which is connected to said hub,

a sun gear in mesh with said planet gear and rotatably mounted on said shaft,

said ring, planet and sun gears located outwardly of said hub,

said sun gear having a first clutch portion thereon,

an axially movable clutch member rotatable with said shaft having a second clutch portion thereon arranged to engage said first clutch portion in one position of said clutch member,

a remotely operable hydraulic mechanism for selectively moving said clutch member axially to said one position thereby to connect said sun gear for conjoint rotation with said shaft, and

said hydraulic mechanism comprising an annular piston

encircling said shaft and slidable in a bore in the end of said spindle.

4,611,507

AUTOMOTIVE GEARSHIFT JOLT MINIMIZATION SYSTEM

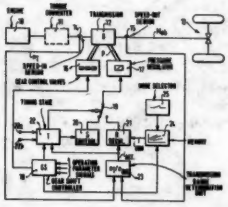
Rainer Burkel, Asperg; Alfred Müller, Gröbenzell; Cornelius Peter, Stuttgart, and Manfred Schwab, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 436,612, Oct. 25, 1982. This application Mar. 18, 1985, Ser. No. 713,567

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205767

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—866 **6 Claims**



1. Pressure-operated automotive automatic transmission (12) containing transmission fluid under pressure therein, and having an input shaft and an output shaft, whose respective rotational speeds define a transmission ratio (i),

a transmission fluid pressure regulator (17),

input speed sensing means (14) for sensing the speed of the input shaft to the transmission and delivering a transmission input speed signal (nT);

output speed sensing means (15) for sensing the speed of the output shaft of the transmission and delivering a transmission output speed signal (n_{out});

pressure control means (19,20,21) responsive to the input speed signal (nT) and the output speed signal (nout) and continuously varying the pressure (p) of said fluid within the transmission;

and a timing circuit means (22,T,24) connected to and controlling the pressure control means (19,20,21) said pressure control means controlling the fluid pressure regulator (17), in accordance with a predetermined time-varying control function (i_{com}), said fluid pressure regulator controlling said transmission ratio (i) of the transmission during a gear shifting operation.

4,611,508

ENDODONTIC INSTRUMENT

James B. Roane, 707 SW. 24th St., Norman, Okla. 73069

Division of Ser. No. 573,505, Jan. 24, 1984, Pat. No. 4,536,159, which is a division of Ser. No. 464,972, Feb. 8, 1983, Pat. No. 4,443,193. This application May 14, 1985, Ser. No. 734,390

Int. Cl.[4] B24B *3/26*

U.S. Cl. 76—24 R **20 Claims**

1. A method of manufacturing an improved endodontic instrument, said method comprising the steps of:

eliminating, from an instrument of the type having a plurality of rotationally bi-directional cutting edges formed by axially twisting a blank having a polygonal cross-section, sharp points normally present at an intersection of a conically tapered tip of said instrument with ends of said cutting edges; and

wherein said eliminating step is further characterized as modifying said tapered tip to have an axially innermost portion of frusto-conical shape having an included angle

of substantially less than an included angle of a conically shaped axially outermost portion of said tapered tip.

4,611,509

METHOD OF MANUFACTURING A DENTAL ROOT CANAL CUTTING TOOL AND APPARATUS THEREFOR

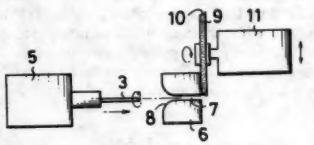
Kanji Matsutani, Takanezawa, Japan, assignor to Matsutani Seisakusho, Japan

Filed Oct. 3, 1984, Ser. No. 657,392

Claims priority, application Japan, Oct. 6, 1983, 58-185962

Int. Cl.[4] B24B *19/02, 3/24*

U.S. Cl. 76—24 R **2 Claims**



1. A method for manufacturing a dental root canal cutting tool comprising the steps of:

inserting a wire rod into a guide hole having a slightly larger inside diameter than the diameter of the wire rod;

revolving and advancing the wire rod at a fixed rate while the wire rod is being inserted into the guide hole;

supporting the wire rod in all environmental directions by the inside environment of the guide hole;

grinding the wire rod by a thin whetstone having a fixed tip at an edge thereof just after the wire rod penetrates and exits the guide hole; and

gradually varying the space between an axial center of the guide hole and the tip of the whetstone in response to the advance of the wire rod.

4,611,510

TOOL FOR REMOVING PACKING

Ronald R. Morton, 2746 Chryslar, Cape Girardeau, Mo. 63701

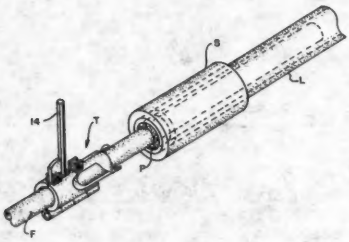
Filed Aug. 7, 1985, Ser. No. 763,391

Int. Cl.[4] B25B *33/00*

U.S. Cl. 81—8.1 **6 Claims**

1. A tool for use in removal of a packing embedded intermediate a first feed tube and a concentric-like second tube and which tubes are capable of moving longitudinally axially relative to each other, and with said packing normally being held by a stuffing box to effectively seal any pressurized air or the like within said tubes even during their select axial relative movement, the improvement which comprises, said tool incorporating a cylindrical-like member provided for being arranged adjacent one of said tubes and aligned with said packing, at least one piercing member projecting integrally and frontally from the said cylindrical-like member, said piercing

member having a sharpened forwardmost edge and positioned for cutting into the packing upon movement of one tube and its packing towards said tool, said cylindrical-like member formed of a pair of semi-cylindrical halves, hinge means provided adjacent edges of said halves to hold said halves pivotally connected thereto, and fastening means securing proximate the opposite adjacent edges of said halves and useful for holding said cylindrical-like member around a tube, said cylindrical-like member having an opening therethrough, locking means operatively associated with the cylindrical-like member for



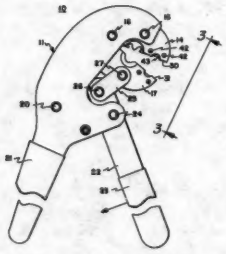
securing said cylindrical-like member upon the first mentioned tube as its piercing member cuts into the packing, said locking member belong pivotally mounted to the cylindrical-like member, said locking member disposed for partially pivoting into said cylindrical-like member opening and being forced against the first mentioned tube to hold the tool fixed with respect to said tube during tool application, whereby as the second tube and its stuffing box arranged packing moves towards the said tool, the said tool piercing member cutting into said packing and removing the same from the stuffing box while the tool is held stationery through application of its locating member.

4,611,511

ELECTRICIAN'S TOOL

C. Fred Mykkanen, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 1, 1984, Ser. No. 655,790
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.44 **1 Claim**



1. In a tool for use in stripping insulation of a first diameter from conductors of a second diameter, in combination:

a frame;

a first jaw fixed in said frame and a second jaw pivoted in said frame about a first axis for movement into and out of a closed position relative to said first jaw, said jaws having surfaces for defining a mating plane and having notches arranged in apposition to jointly define, in said closed position, a substantially cylindrical space of substantially said first diameter, with its axis lying in said mating plane and extending generally parallel to said first axis;

means for causing pivotal movement of said second jaw in said frame;

a pair of plane cutting blades each having a rectilinear cutting edge;

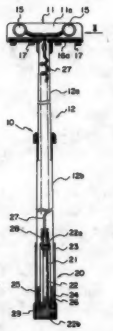
and means mounting said blades severally in said jaws, substantially midway along said cylindrical space, to extend across said notches in a common plane orthogonal to said axis of said space, so that in said closed position of said jaws said edges are substantially parallel and spaced by a distance equal to said second diameter, and said cylindrical space extends axially in both directions from said blades, to prevent distortion of both cut ends of said insulation during operation of said blades.

4,611,512

DEVICE FOR REPLACING FLUORESCENT LAMPS

Hirosi Honda, 24-15, Midorigaoka 2-Chome, Kushiro-shi, Hokkaido, Japan

Filed Feb. 26, 1985, Ser. No. 705,527
Int. Cl.[4] H01K *3/32*
U.S. Cl. 81—53.1 **10 Claims**



1. A device for replacing a fluorescent lamp in an installation position thereof comprising:

a fluorescent lamp supporting member having a substantially channel-shaped cross section with a trough-like interior for accommodating a fluorescent lamp;

an elongatable supporting rod connected to the lamp supporting member and adapted to be held at the lower part thereof by hand for raising or lowering the lamp to or from the installation position;

lamp holding means disposed within said trough-like interior of the lamp supporting member and being controllably operable to hold a lamp firmly and to release the same, said lamp holding means comprising bag members disposed within the trough-like interior on one lateral side thereof and being expanded and contracted by a fluid supplied thereinto and discharged therefrom, at least one support member disposed on the opposite lateral side of the trough-like interior and functioning cooperatively with the bag members to clamp a lamp therebetween when the bag members are expanded;

a pump mechanism disposed in the lower end portion of said supporting rod for supplying and discharging said fluid into and from the bag members; and

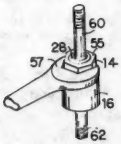
fluid conducting means intercommunicating the pump memchanism and the bag members.

4,611,513

OPEN ACCESS STUD GRIPPING TOOL

Richard H. Young, 212 Andover Rd., Billerica, Mass. 01821, and Edward T. McLaughlin, 21 Concord St., Wilmington, Mass. 01887

Filed Nov. 19, 1985, Ser. No. 799,591
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—53.2 **11 Claims**



1. A stud gripper tool having open access axially through the tool so that the tool may slide down the stud to any desired length for gripping the stud at any desired point for removing or installing the stud, wherein the tool comprises:

an elongated, hollow tubular casing having a working end and a handle end and having an interior surface comprising at least one pair of stepped lobes axially aligned in a longitudinal relationship formed on the interior surface of the casing, wherein the lobe at the working end comprises a larger radius of curvature and intrudes into the interior surface further than the lobe at the handle end;

at least one elongated, axially extending, roller comprising a stepped shaft having a larger diameter cylindrical shaft portion at the working end in rolling contact with the larger and radius lobe, and a smaller diameter cylindrical shaft portion at the handle end in rolling contact with the smaller radius lobe, wherein the stepped shaft moves radially while moving circumferentially relative to the lobes, wherein a recess into the roller around the circumference of the roller separates the two shaft portions;

roller retaining means mounted within the casing in engagement with the recessed ring for maintaining the roller in rolling contact with the pair of stepped lobes, wherein the retaining means remains within circumferencial boundary limits of the larger diameter shaft portion of the roller to maintain a clear interior opening through the entire casing from the working end to the handle end to admit a stud therethrough, which stud may be approximately equal in diameter to the circumferencial boundary of the larger diameter shaft portion of the roller;

a handle receiving means on an exterior of the casing at the handle end to receive a handle means rigidly secured thereto for turning the casing;

wherein the larger diameter shaft portion of the roller is free to roll on the large radius lobe when the roller engages and tightens on a stud during turning of the casing.

4,611,514

MULTI-PURPOSE SOCKET RATCHET WRENCH

Henry D. Hyde, 3229 Park Hills Dr., Austin, Tex. 78746

Filed Dec. 23, 1985, Ser. No. 812,749
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—60 **3 Claims**

1. An improved multipurpose socket ratchet wrench comprised of:

A. a ratchet head comprised of a:

(1) ratchet head casing made of rigid material being of generally rectangular shape but having rounded corners, and having length of about one and one-half the width and thickness about one-third the width, and containing a

(2) socket ratchet wheel and pawl of conventional design, said ratchet wheel being mounted permanently around

(3) a socket wrench mandrel which extends through said ratchet wheel and said ratchet head casing on two sides of said casing, said socket wrench mandrel exhibiting

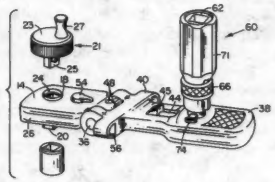
(4) a socket probe with a retainer/release mechanism on one side of said ratchet head casing and exhibiting a

(5) socket recess on the opposite side of said ratchet head casing, said socket ratchet wheel, socket wrench mandrel, socket probe and said socket recess all rigidly affixed together and generally forming a figure of revolution with all said described parts having a common centroidal axis, said ratchet head also containing

(6) a ratchet reverse mechanism of conventional design of which only a reverse lever is visable from the exterior of said wrench, and said ratchet head also having

(7) a pair of rails moulded into said ratchet head casing, the width of said rails being approximately two-thirds the thickness of said ratchet head casing and height approximately one-fifth of said rail width, said rails being positioned parallel to one another but facing outward on opposite ratchet head casing sides, the centerlines of said rails being in a plane perpendicular to the axis of said socket wrench mandrel, and to said ratchet head is permanently moulded

B. A ratchet head pivot boss, a cylindrically shaped appendage to said ratchet head attached to said ratchet head and proximal to said ratchet reverse mechanism, the outer surface of the cylindrical shape moulding into said ratchet head casing such that the axis of the cylindrical shape is perpendicular to the axis of said socket wrench mandrel, and such that the axis of the cylindrical shape lies generally in a plane that is perpendicular to the centerline of



said socket wrench mandrel and passes through the center of gravity of said ratchet head assembly group, the height of said cylindrically shaped ratchet head pivot boss being approximately one-half the width of said ratchet head casing and having a diameter slightly greater than the thickness of said ratchet head casing, said ratchet head pivot boss having removed from it a

(1) wrist pin bearing hole, said bearing hole being of cylindrical shape and being concentric with said cylindrical shape of said ratchet head pivot boss and having a diameter approximately one-half the diameter of said ratchet head pivot boss having removed from its surface a plurality of

(2) bolt lock recesses, said recesses being shallow holes drilled part-way through the surface of said ratchet head pivot boss towards and perpendicular to the centerline of said ratchet head pivot boss, one of said bolt lock recesses having its centerline perpendicular to the centerline of said socket wrench mandrel and the remaining bolt lock recesses being drilled at angles to the first, with centerlines of all bolt lock recesses being in a plane perpendicular to the axis of said ratchet head pivot boss and bisecting said ratchet head pivot boss into two similar cylinders, and through said wrist pin bearing hole is inserted

C. a cylindrically shaped wrist pin of such dimension that said wrist pin bearing hole is completely filled and said wrist pin extends out from said ratchet head pivot boss in both directions by some distance, the length of said wrist pin being approximately twice the height of the cylindri-

cal shape of said ratchet head pivot boss, the ends of said wrist pin extending through

D. a pair of wrist pin pivot bosses mounted on either side of said ratchet head pivot boss, said wrist pin pivot bosses being generally hollow cylinders having outside and inside diameters similar to those described for said ratchet head pivot boss but having cylindrical heights approximately one-half that of said ratchet head pivot boss, said pair of wrist pin pivot bosses being rigidly attached at a portion of their outer surfaces to a

E. cross bar guard, a solid bar of rigid material having a generally square cross-section somewhat longer than the width of said ratchet head casing having its length running parallel to the centerline of said wrist pin and being attached to said wrist pin pivot bosses such that said ratchet head pivot boss can be rotated freely with respect to said cross bar guard, said cross bar guard having removed from it two.

(1) semicylindrical shaped bar receiving channels perpendicular to the center line of said wrist pin and intersecting the centerline of said cross bar guard, and having rounded portions facing away from one another and flat portions of said semicylinders being generally in the same planes as are the bases of said rails and said flat portions of said semicylinders being parallel to one another, said cross bar guard also having a

(2) ball gallery of cylindrical material removed along the centerline of said cross bar guard, and extending between said semicylindrical bar receiving channels, the diameter of said ball gallery being approximately one-sixth of the thickness of said cross bar guard, said ball gallery including a plurality of

(3) lock balls, the functional unit comprised of said ball gallery and said plurality of lock balls being a chain reaction lock device, and to the side of said cross bar guard distal to said wrist pin pivot bosses is attached a

F. grip lever handle, being split generally by a plane that includes the centerlines of said wrist pin and said cross bar guard, said grip lever handle being symetrical about the just described plane, and having length approximately equal to the sum of the length of said ratchet head casing and the diameter of said ratchet head pivot boss, said grip lever handle having cut into it a

(1) fixed socket recess located approximately midway along the length of said grip lever handle and having its centerline perpendicular to the centerline of said cross bar guard and the plane splitting said grip lever handle, said grip lever handle being also supplied with a

(2) barrel drilled into said cross bar guard and said grip lever handle along the geometric centerline of said wrench from the space between said wrist pin pivot bosses toward, but not intersecting, said fixed socket recess, said grip lever handle also being supplied with a

(3) bolt access notch, a rectangular shaped opening through said grip lever handle opening to the same sides of said grip lever handle as does said fixed socket recess and having its long sides parallel to the long axis of said grip lever handle and extending between but not intersecting said fixed socket recess and said cross bar guard, said bolt access recess notch and said barrel making up a common opening into which is fitted a

G. Bolt, of generally cylindrically shape movable within the confines of said barrel and being spring loaded toward said cross bar guard and wrist pin pivot bosses' end of said grip lever handle, and engaging said bolt lock recesses in said ratchet head pivot boss, and engaging a train of lock balls placed in said ball galleries of said cross bar guard, said bolt being supplied with a

H. Knurled grip thrust plate, rigidly affixed to said bolt and of such size and dimension so as to move within said bolt access recess notch and setting limits to the back and forth movement of said knurled grip thrust plate unit assembly; and, as an integral part of the invention but not a permanent attachment is, a

I. Forked lever/balance auxiliary handle comprised of two

(1) fork bars substantially longer than width or depth and being of length slightly greater than said grip lever handle, and spaced apart at a slightly greater dimension than the width of said ratchet head, the interior surfaces of said fork bars containing

(2) elongated slots extending along said fork bars having depths slightly greater than the height of said rails and having widths slightly greater than the width of said rails, and to the ends of said fork bars are

(3) semicylindrical extensions of such semicylindrical shape and alignment so as to just fit into said semicylindrical recess notches, each said semicylindrical extension being provided with

(4) a match notch cut into the inner face of said semicylindrical extensions so that said match notches are perpendicular to the length of said fork bars, and adjoining and holding said two fork bars in position is a

(5) balance weight handle of approximately rectangular cross section and generally joining said fork bars and extending parallel to and away from said fork bars, said fork bars of said auxiliary handle being such that when installed over said ratchet head and engaging said semicylindrical notches that said wrench exhibits a center of gravity along the centerline of said socket wrench mandrel.

4,611,515

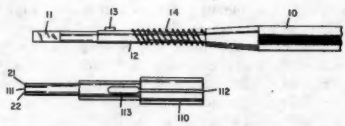
TOOL FOR CONTROL AND USE OF MINIATURE SCREWS AND THREADED FASTENERS

Edgar F. Marbourg, Jr., 437 Hillcrest Rd., San Carlos, Calif. 94070

Division of Ser. No. 577,071, Jan. 26, 1984, Pat. No. 4,581,962, which is a continuation-in-part of Ser. No. 385,540, Jun. 7, 1982, Pat. No. 4,455,898. This application Oct. 22, 1985, Ser. No. 790,120

Int. Cl.[4] B25B *23/08*

U.S. Cl. 81—454 **2 Claims**



1. A miniature screwdriver or tool for very small threaded fasteners, around the shaft of which has been installed a coil spring one end of which bears upon the handle of said tool, said spring extending substantially down said shaft of said tool, further providing

that fixedly attached to the shaft of said tool, between said coil spring and the tip of said tool is a tube of stiff, tough but resilient material disposing outwardly a small projecting pin to act as a guide pin;

that associated with said tool, a barrel of stiff but resiliently deformable plastic encompasses said tool shaft so that the tip of said tool is in a closely cooperative relationship with one end of said barrel, said end of said barrel being of the minimum practicable diameter;

that at said end of said barrel which is associated with said tip of said tool, said barrel is slit longitudinally into a plurality of relatively thin, flexible segments which act as resilient gripping members for gripping heads of small threaded fastners, in association with an annular groove and shoulder in the interior surfaces of said resilient members which positively grip said head of a fastener accepted by said flexible members which expand outward to accept said fastener head, then contract upon it;

that the other end of said barrel be formed into a head section of greater diameter, disposing at the end of said head section nearest the handle of said cooperating tool an

annular recess which accepts the end of said coil spring assembled upon said shaft of said tool, which said spring bears upon said handle of said tool and upon said barrel to extend said barrel towards the said tip end of said tool;

that one longitudinal slot, of width slightly less than the diameter of said guide pin on said tool shaft, extend from the end of said head section of said barrel nearest the handle of said associated tool a substantial distance into the part of said barrel which is of reduced diameter, terminating in a broadened portion of said slot, of width slightly greater than the diameter of said guide pin;

so that the said barrel may be emplaced over the shaft of said cooperating tool by forcing said slot in said barrel over said guide pin, said barrel deforming sufficiently to pass said guide pin, so that said guide pin is then contained within said broadened portion of said slot to limit and guide movement of said barrel relative to said tool shaft.

4,611,516

METAL WORKING CUTTING TOOL

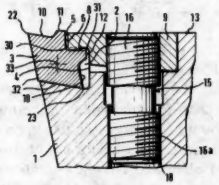
Walter Hochmuth, Nuremberg, and Hans-Peter Hollfelder, Fürth, both of Fed. Rep. of Germany, assignors to Zinner GmbH, Nuremberg, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,121

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343448

Int. Cl.⁴ B23B *3/26, 29/034*

U.S. Cl. 82—1.2 **17 Claims**



1. A metal working cutting tool comprising a tool mounting means having an open recess, said tool mounting means having a bottom wall along with an inner wall and a support wall with said support wall being spaced from said inner wall, said bottom wall, inner wall and support wall defining walls of said recess, a tool insert mounted in said recess, said tool insert being in the approximate shape of a prism and having two diagonally opposite cutting edges, each of said cutting edge being formed by a cutting face which is disposed at an acute angle with a principal support face, a longitudinal groove in said tool insert disposed at an inner end of said cutting faces, said groove having two side walls, a channel in said tool mounting means, clamping jaw mounted in said channel, said clamping jaw having an engaging surface clampingly engaging one of said side walls of said groove, said support wall of said tool mounting means engaging said other of said side walls of said groove, whereby the tool insert is held abuttingly by said support wall of said recess, said engaging surface of said clamping jaw, and said bottom wall of said recess.

4,611,517

PROCESS AND APPARATUS FOR CONTINUOUS LENGTHWISE CUTTING OF A PILE WEB

Carl Schmale, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale GmbH & Co. KG, Ochtrup, Fed. Rep. of Germany

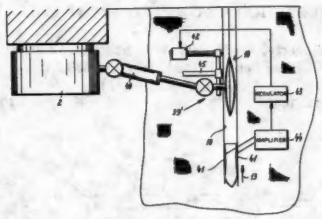
Filed Jan. 18, 1985, Ser. No. 692,903

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403710

Int. Cl.⁴ D06H *7/04*

U.S. Cl. 83—56 **32 Claims**

1. In a process for the continuous cutting of a pile fabric web, having at least one comparatively narrow pile-free zone running lengthwise thereon between pile surfaces lengthwise in the exact center of said zone, wherein said fabric web is fed lengthwise along a transport path to a continuous cutting device and the position of said cutting device transverse to the feed direction of said web is adjusted so that said zone is cut lengthwise along said exact center of said zone, the improvement which comprises automatically sensing the position of said zone by a slider to sense both pile edges flanking said zone and riding thereon, and communicating a position of the sensed edges transverse to said feed direction of said fabric web to a means for adjusting said transverse position of said cutting device so as to cut automatically said fabric exactly in said center of said zone, said slider being provided with a guide peg



protruding upwardly from the underside of said slider through a cut in said fabric web and is shaped to help hold said fabric web to said slider, and wherein said guide peg is T-shaped, a stem of said T-shaped guide peg protruding upwardly through a slot provided in said slider and arms of said T-shaped guide peg being positioned below said cut in said fabric web, said stem of said T-shaped guide peg being attached to the center of two leaf springs attached lengthwise on the upper surface of said slider to provide a means for pressing said cut fabric web upwardly to said slider to provide for a smoother, more reliable cutting operation, and wherein said slider is constructed and positioned so as to be penetrated by a rotatable cutting knife.

4,611,518

DEVICE FOR INTRODUCING A WEB OF MATERIAL INTO A PROCESSING MACHINE

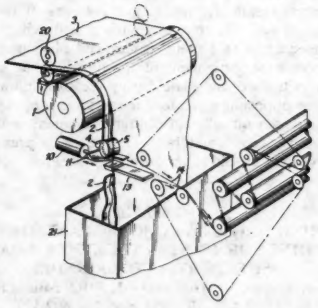
Arno Hildebrandt, Neuss, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,240

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329987

Int. Cl.⁴ B26D *7/18*

U.S. Cl. 83—105 **3 Claims**



1. An apparatus for introducing a web of material into a processing machine, comprising: a knife for separating a strip from one edge of the web; means downstream of the knife for

conveying the web and the strip vertically downwardly including a pair of driven pressure rollers downstream of the knife for grasping the strip therebetween; means downstream of the rollers for diverting the strip out of its vertical path into a horizontal path which is to one side and perpendicular to the web including a rope scissors and a transverse knife disposed between the driven rollers and the rope scissors for severing the strip to form a leading edge of the strip and having a guide surface thereon for directing the leading edge of the strip in the horizontal path into the rope scissors; and means for pivoting the pressure rolls around a vertical axis.

4,611,519

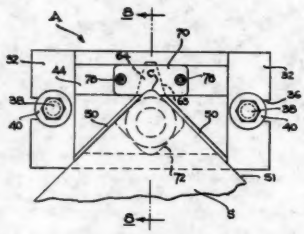
RADIUS CORNER FORMING APPARATUS AND METHOD

Lloyd A. Hagerty, 10315 Parr Ave., Sunland, Calif. 91040

Filed Sep. 13, 1984, Ser. No. 650,235

Int. Cl.[4] B26F *1/14*

U.S. Cl. 83—389 **17 Claims**



1. Apparatus for producing a radius corner in a metal sheet and like sheet material, said apparatus comprising:

(a) a plate having a relatively flat surface adapted to receive a sheet in which a corner portion is to be formed into a radius corner, said plate having a corner portion,

(b) a die block co-operating with the corner portion of said plate and having a radius corner area substantially equivalent to the radius corner to be formed on the sheet and adapted to form the radius corner on the sheet, said die block having an upper surface to receive a corner portion of the sheet to be servered from the sheet,

(c) a punch adapted to be attached to the lower end of a shiftable element of a punch press, said punch having a corner portion corresponding to the corner portion of the die block and where the corner portion of the punch engages the sheet at the radius corner area of the die block and cuts off the portion of the sheet to be severed from the sheet in a shearing action when the shiftable element is shifted thereby providing a radius corner on the sheet, and

(d) means resiliently opposing a pressure of the shiftable element and punch when shifted and which means is connected to said plate to bias said plate in a direction opposite the movement of the punch when said punch moves toward said plate during the shearing action, said means opposing a pressure thereby resisting any substantial movement of said shiftable element and plate to thereby capture and hold said sheet to prevent lateral movement of said sheet during the shearing action.

4,611,520

PUNCHING UNIT IN A PUNCHING AND/OR BINDING MACHINE FOR JOINING TOGETHER A PACK OF SHEETS BY A COMB BINDER

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Filed Apr. 20, 1984, Ser. No. 602,375

Claims priority, application Italy, Apr. 22, 1983, 21635/83[U]

Int. Cl.[4] B26D *5/10*; B26F *1/04*

U.S. Cl. 83—549 **5 Claims**

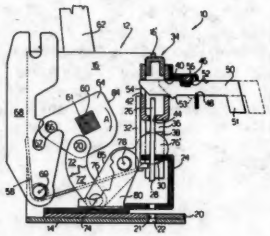
1. A punching unit for use in a punching or perforating binding machine for binding a pack of sheets, said punching unit comprising:

a bar fixedly mounted on a framework of the machine and having a plurality of substantially vertical openings,

a plurality of punches extending through said plurality of openings and having bottom cutting edges and tangs projecting above the top of said fixed bar,

a movable bar mounted above said fixed bar and movable relative to said fixed bar between an operating position in which said punches engage the pack of sheets and a non-operating position in which said punches are spaced from the pack of sheet,

a plurality of latches carried by said movable bar and movable between a first position in which they operate respective punches and a second position in which the respective punches are not operated by said plurality of latches, and



control means for effecting movement of said movable bar, said control means including a control shaft rotatably supported on the framework of the machine, a plate mounted on shaft for joint rotation therewith, a pivotable lever for moving said movable bar upon rotation of said plate, and connecting means for connecting said pivotable lever to said plate and having one end attached to said plate and the other end attached to said pivotable lever for pivoting the same upon rotation of said plate to thereby effect movement of said movable bar,

said movable bar having slide means fixedly attached thereto for supporting said movable bar for movement on the framework of the machine, and said pivotable lever having its fulcrum at a fixed location on the framework of the machine and having a head portion extending beyond the fulcrum and engaging said slide means for moving said slide means and said movable bar upon pivotal movement of said pivotable lever.

4,611,521

CHAIN SAW ATTACHMENT

Gordon R. McCardle, 9 Tripoli Road, Panmure, Auckland, New Zealand

Filed Jun. 12, 1984, Ser. No. 620,079

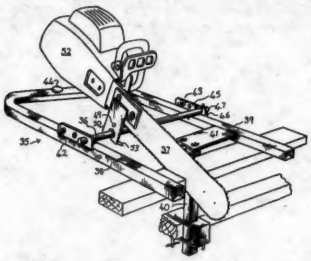
Claims priority, application New Zealand, Jun. 13, 1983, 204533

Int. Cl.[4] B27B *17/08*

U.S. Cl. 83—796 **4 Claims**

1. An attachment for a chainsaw having an elongated cutting bar, including a bracket adapted to be secured by fasteners to said cutting bar, a pivot arm extending from either side of said bracket in a line substantially orthogonal to the length of said cutting bar and below said fasteners, whereby in use said pivot arm can act as a guard to reduce the risk of operator injury

with a hand-wielded chainsaw, an open support frame having pivot supports on either side thereof for reception of said pivot



arm, and a substantially vertical post which can swivel and on which said open support frame is mounted.

4,611,522

TONE WAVE SYNTHESIZING APPARATUS

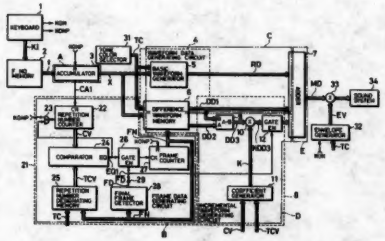
Suzuki Hideo, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hammatsu, Japan

Filed Apr. 5, 1985, Ser. No. 720,174

Claims priority, application Japan, Apr. 10, 1984, 59-71549; Oct. 29, 1984, 59-228685

Int. Cl.[4] G10H *1/00*; G06F *1/02*

U.S. Cl. 84—1.01 **5 Claims**



1. A tone wave synthesizing apparatus comprising:

phase addressing means for generating a phase address signal which designates phase addresses progressively and repetitively;

time frame designating means for sequentially designating, for each tone wave to be synthesized, a series of time frames one after another, each time frame being of duration longer than a single period of the tone wave to be synthesized;

elementary wave generating means for repeatedly generating, for each designated time frame, a period of elementary tone wave in the form of a series of wave sample values in accordance with said phase address signal, said elementary tone wave representing a tone wave at a beginning of the designated time frame;

incremental wave generating means for generating progressively changing incremental waves each in the form of a series of wave sample values in accordance with said phase address signal, said progressively changing incremental waves exhibiting successive changes of waveform from one period to another period by an amount predetermined for each designated time frame; and

wave combining means for combining, in each time frame of said successive time frames, said elementary tone wave and said progressively changing incremental waves.

4,611,523

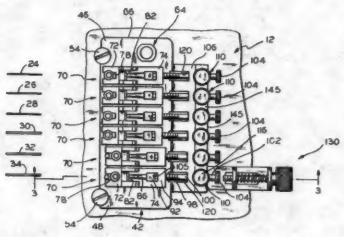
DEVICE FOR SETTING THE INTONATION OF THE INDIVIDUAL STRINGS OF A FRETTED STRING INSTRUMENT

John H. McFarland, 1101 N. Paulina St., Chicago, Ill. 60622

Filed May 17, 1985, Ser. No. 735,139

Int. Cl.[4] G10D *3/00*

U.S. Cl. 84—313 **8 Claims**



1. In a device for tuning a stringed musical instrument, wherein each string of the instrument makes a first critical contact with the instrument at a point on the instrument nut and a second critical contact at a point on the instrument bridge, in which the instrument includes for each string thereof, discrete from the other strings thereof, a separate string support mounted on the instrument bridge including a first forward body releasably clamped to the bridge against movement toward in the direction toward the nut under tension in the string, a second rear body rearward of and aligned with and pivotally connected to the forward body for swinging movement about a pivot axis extending normally of the bias acting on the first body due to the tension in the spring, with the second body including a string contact surfacing that includes said second critical contact point and an abutment surface rearwardly of said second critical contact point against which the string is clamped, with the second body including a wall shaped rearward of its said abutment surface, a block located between said second body abutment surface and said second body abutment surface and said second body wall, and a first screw member including a shank threaded in said second body wall and abutting said block for clamping the string against said abutment surface and a head rearwardly of said second body for rotating said first screw member to clamp or release the string relative to said abutment surface, and with the bridge being equipped with a flange overlying said shank of said first screw member and a second screw member having a shank engaging the shank of said first screw member pivoting said second body relative to said first body for fine tuning of the string,

a tool for setting the intonation of the string comprising:

a first elongate rigid member having one end formed for seating against the bridge flange in substantially parallel relation to the shank of the first screw,

a second member mounted for shifting movement longitudinally of said first tool member and including a flange portion adapted to seat against the head of the first screw member,

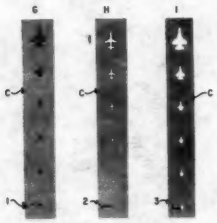
and means for feeding said tool second member longitudinally of said tool first member to, when the bridge first forward body is released whereby the string tension is applied to said tool, shift said bodies to set the intonation of the string.

4,611,524

CAMOUFLAGED VEHICLE SUCH AS AN AIRCRAFT, SURFACE VESSEL OR THE LIKE

Carlisle K. Ferris, 50 Moraine Rd., Morris Plains, N.J. 07950

Filed Aug. 20, 1984, Ser. No. 642,358
Int. Cl.[4] F41H *3/00*
U.S. Cl. 89—36.01 19 Claims



1. A camouflage and deceptive perception distorted vehicle for combat use at least a substantial portion of which will remain undetected until the vehicle subtends an arc of substantially five minutes when used against at least one predetermined light background reflectivity, hue and saturation comprising:

(a) top, bottom, upper and lower side surfaces

(b) at least one of said surfaces having at least one substantial edge outlined area

(c) said edge outlined area having a predetermined reflectance, hue and saturation less than said at least one predetermined background reflectivity, hue and saturation

(d) said edge outlined area including a substantial central portion having substantial width

(e) said edge outlined area including a substantial edge outline portion having substantial width and having sections extending a substantial distance along opposite sides of said substantial central portion

(f) said substantial central portion and said substantial edge outline portion having differing reflectances

(g) said substantial central portion's reflectance being substantially greater than the reflectances of any of said substantial edge outline sections extending along opposite sides of said substantial central portion

(h) the total reflectance, hue and saturation of said substantial central portion, when added to the sum of the total reflectance, hue and saturations of said edge outline sections extending along opposite sides of said substantial central portion, substantially averaging to said at least one predetermined light background reflectivity, hue and saturation

(i) whereby, when said vehicle is used against said predetermined background, said substantial edge outlined area on at least said one of said surfaces, will substantially match said background and blend said area into said background preventing detection of said area.

4,611,525

CADENCE REGULATOR FOR A GAS-PRESSURE OPERATED FIRING WEAPON

Werner Bosshard, Zurich, Switzerland, and Willi Schröder, Jestetten, Fed. Rep. of Germany, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

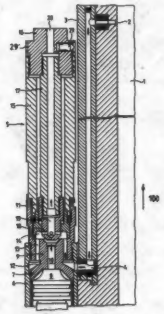
Filed Jun. 24, 1985, Ser. No. 748,556
Claims priority, application Switzerland, Jul. 3, 1984, 3187/84
Int. Cl.[4] F41D *5/08*
U.S. Cl. 89—193 7 Claims

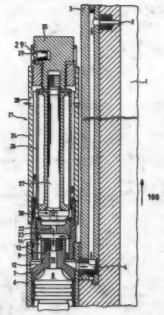
1. A cadence-regulating device for a gas-pressure operated automatic firing weapon, comprising:

a gas passage defining a predetermined cross-section for conducting gases having a gas pressure and an elevated gas temperature from a weapon barrel of the firing weapon to an actuating mechanism of the firing weapon;

a movable throttling member arranged in said gas passage for regulating said gas pressure by temperature-dependently altering said predetermined cross-section of said gas passage;

regulating means for moving said throttling member;





said regulating means comprising a first tube defining a first tube end and a second tube for discharging said gases to ambient pressure and defining a second tube end;

said first tube end and said second tube end being interconnected; and

said first tube and said second tube differentially expanding in response to said gases being discharged through said second tube at said elevated temperature.

4,611,526

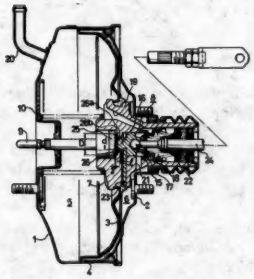
REACTION TRANSMITTING MECHANISM FOR BRAKE BOOSTER

Masao Arino, Higashimatsuyama, and Yoshimichi Inoue, Saitama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed May 9, 1985, Ser. No. 732,483
Claims priority, application Japan, May 22, 1984, 58-75020
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369 A 5 Claims

1. A reaction transmitting mechanism for brake booster which includes a valve mechanism for controlling the opening or closing of a path for fluid in accordance with a corresponding forward or rearward movement of a valve plunger which is mechanically coupled to an input shaft, an output shaft having one end slidably fitted in a valve body in which the valve mechanism is disposed, and a reaction disc interposed

between said one end of the output shaft and the valve plunger for transmitting a reaction force from the output shaft to the input shaft through the reaction disc and the valve plunger; the reaction transmitting mechanism comprising a reaction transmitting member interposed between the reaction disc and the valve plunger so as to be movable toward or away from the valve body, the reaction force being transmitted from the reaction disc to the valve plunger through a transmission path including the reaction transmitting member and a transmission path not including the reaction transmitting member, first means on said valve plunger and reaction transmitting member responsive to initiation of braking movement of said valve plunger for application of said reaction force from said reaction disc to said valve plunger simultaneously through both said transmission paths, namely directly to the valve plunger and indirectly to the valve plunger through the reaction transmitting member, such that the reaction disc and the valve plunger are coupled together through the reaction transmitting member when the brake is initially actuated, second means on said valve body and reaction transmitting member responsive to initiation of brake release movement of said valve plunger for reducing application of said reaction force from said reaction disc to said valve plunger to only one said transmission path, namely only directly to the valve plunger and not through said reaction transmitting member, said second means including initially abutable surface means on said valve body and reaction transmitting member engageable upon initial retraction of said valve plunger for limiting the retracting movement of the reaction transmitting member to uncouple the latter from the valve plunger and allow completion of retracting movement of the valve plunger without the reaction transmitting member.



4,611,527

POWER TRANSMISSION

Robert H. Breeden, Metamora, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 625,084, Jun. 27, 1984, abandoned, which is a division of Ser. No. 346,564, Feb. 8, 1982, Pat. No. 4,475,442. This application Sep. 6, 1985, Ser. No. 774,163

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—420 **2 Claims**

1. A hydraulic control system comprising

a hydraulic actuator having an element and opposed openings adapted to alternately function as inlets and outlets for moving the element of the actuator in opposite directions,

a pump for supplying fluid to said actuator, pilot operated meter-in valve means to which the fluid from the pump is supplied,

means for alternately supplying pilot fluid pressure to said meter-in valve means,

said meter-in valve means being pilot controlled by alternately supplying fluid at pilot pressure to said meter-in valve means for controlling the direction of movement of the actuator,

a pair of lines extending from said meter-in valve means to said respective openings of said actuator,

a drop check valve in each said line,

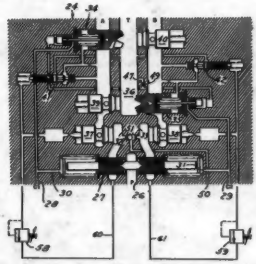
pilot pressure operated meter-out valve associated with each opening of the actuator for controlling the flow out of said actuator,

said meter-out valve being pilot operated by the pilot pressure,

a pilot pressure operated poppet valve associated with each said meter-out valve means normally functioning as a relief valve for its associated meter-out valve, each poppet valve having an inlet port, an outlet port and a spring chamber, and

a first line and a second line,

said first line extending between the supply pressure to said meter-in valve means and the spring chamber of the poppet valve associated with the other of said actuator openings,



said second line extending between the supply pressure to said meter-in valve means and the spring chamber of the poppet valve associated with the other of said actuator openings,

a relief valve in each said line such that when pilot pressure is applied to said meter-in valve means, the meter-in valve means is operated to apply supply pressure to one actuator opening and the pilot pressure is also supplied through one of said first and second lines to the mter-out valve associated with the other opening to open said meter-out valve and when the meter-in valve means is returned to a neutral position due to an absence of pilot pressure, the pressure is reduced on the relief valve in said one of said first and second lines to said meter-out valve associated with the other opening and causes the poppet valve to open and permit the associated meter-out valve to function as a relief valve for the load pressure being built up at the respective actuator opening.

4,611,528

POWER TRANSMISSION

Vinod K. Nanda, Rochester, and Henry D. Taylor, Pontiac, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 605,607, Apr. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 320,448, Nov. 12, 1981, abandoned. This application Oct. 15, 1985, Ser. No. 786,724

Int. Cl.[4] F15B *13/042*

U.S. Cl. 91—442 **3 Claims**

1. A hydraulic control system comprising

a hydraulic actuator having a movable element and opposed actuator openings adapted to alternatively function as inlets and outlets for moving the element of the actuator in opposite directions,

a pump for supplying fluid to said actuator,

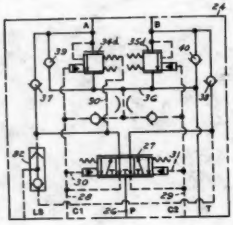
a tank passage for returning fluid to a reservoir,

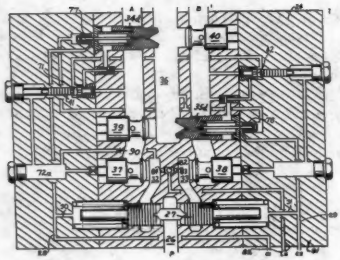
pilot operated meter-in valve means to which the fluid from the pump is supplied,

said meter-in valve means being pilot pressure controlled by alternately supplying fluid at pilot pressure to said meter-in valve means for directing fluid from the pump and controlling the direction of movement of the actuator,

pilot pressure operated meter-out valve means associated with each opening of the actuator and positioned between said tank passage and each hydraulic line to each opening of the actuator for controlling the flow of fluid therebetween,

a pair of lines extending from said meter-in valve means to said respective openings of said actuator such that when said meter-in valve means is operated by pilot pressure to supply fluid through one of said lines to one of said openings of the actuator, pilot pressure also functions to control the opening of the other meter-out valve means associated with the other of said openings to said actuator,





a poppet valve operable as a load drop check valve in each said line operable to open when the pressure in the line exceeds a predetermined value,

each said meter-out valve means having a normally closed spring loaded poppet valve associated therewith, each said poppet valve having a spring chamber biasing the poppet valve closed, and

a passage extending from the spring chamber of one of said poppet valves associated with one of said meter-out valve means and connected to one of said pair of lines upstream of said load drop check valve in said line and operable, when the meter-in valve means is open to apply fluid pressure to said one of said lines and said passage to maintain the associated poppet valve closed, and operable when said meter-in valve means is closed after being open, to reduce the pressure holding the associated spring loaded poppet valve closed, thereby permitting the spring loaded poppet valve to open at a relatively low pressure developed in said one of said lines thereby allowing said one meter-out valve means to open.

4,611,529

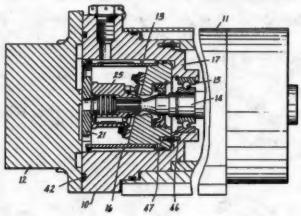
AXIAL PISTON MACHINE CONSTRUCTED IN A REMOVABLE CARTRIDGE FORM TO FACILITATE ASSEMBLY AND DISASSEMBLY

Peter A. Stricker, Jackson, and John J. Schweitzer, Brandon, both of Miss., assignors to Vickers, Incorporated, Troy, Mich.

Filed Jul. 12, 1984, Ser. No. 630,074

Int. Cl.[4] F01B *13/04*

U.S. Cl. 91—499 **26 Claims**



1. In a fluid pressure energy translating device comprising a housing defining a cavity into one end of which a drive shaft is adapted to extend, said cavity having an open end remote from said drive shaft and a removable valve block closing the open end of said housing, said block having an inlet and outlet,

a removable cartridge adapted to be positioned in said cavity,

said cartridge comprising

(a) a valve plate adapted to engage said valve block and an angle block,

(b) a rotatable cylinder barrel adapted to be in abutment with said valve plate and in driving relation with a drive shaft,

said cylinder barrel having a plurality of piston cylinders, each of which has a port for communicating the cylinders with a face of the valve plate,

said housing supporting a bearing for said shaft externally of the cartridge, the portion of said shaft extending into said cartridge being unsupported by bearings within said housing or cartridge,

said valve plate having arcuate ports communicating with the cylinder ports and adapted to communicate with the inlet and outlet of said valve block when the cylinder barrel is rotated relative to said housing,

(c) a piston in each said cylinder,

(d) shoes connected said pistons,

said angle block having an inclined surface engaged by said shoes, and

(e) means interconnecting said valve plate and angle block to form said removable cartridge.

4,611,530

OSCILLATING PISTON MOTOR

Kurt Stoll, Lenzhalde 72, D-7300 Esslingen; Georg Heid, Kernerstr. 5, D-7120 Bietigheim-Bissingen; Gerhard Schrag, Im Braunkiel 14, D-7305 Altbach, and Albrecht Wagner, Bussardstr. 28, D-7065 Winterbach, all of Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 646,319

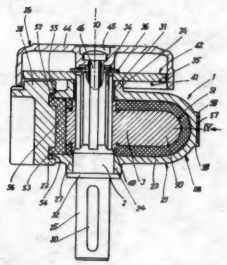
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331382; Oct. 14, 1983, 3337422

Int. Cl.[4] F15B *15/24;* **F01C** *9/00*

U.S. Cl. 92—13.5 **11 Claims**

1. A fluid operated oscillating piston motor comprising a housing defining a space, a shaft rotatably mounted to said housing and extending through said space for oscillating motion about a shaft axis, an oscillating piston connected to said shaft and extending in said space, said piston dividing said space into two working spaces, port means connected to said housing and communicating with said working spaces for admission of fluid under pressure to said working spaces, a disk

keyed to said shaft outside said space, at least one stop body adjustably mounted on said disk, and a stop connected to said



housing and engageable by said stop body with rotation of said shaft to limit motion of said stop body and said shaft.

4,611,531
VENTILATION APPLIANCE

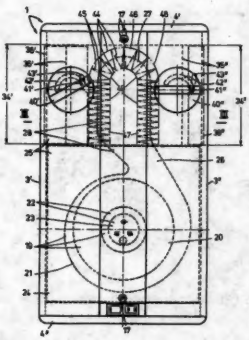
Eckhard Kucharczyk, Wilnsdorf, Fed. Rep. of Germany, assignor to Siegenia-Frank, KG, Siegen, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,181

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 8400940[U]; Nov. 15, 1984, 3441769; Dec. 12, 1984, 3441769

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—39.1 **10 Claims**



1. A ventilation appliance having a radial fan arranged in a box-shaped housing and having an insert body containing a spiral chamber encircling a blower wheel, the housing mountable on an extended surface by a rear wall and having two longitudinal side walls and a front wall facing away from the mounting surface characterized by the fact that

the space between the insert body and the housing forms an air conducting conduit with tangential and radial sections and the chamber of the insert body has an outlet located adjacent the front wall and centrally disposed thereof and the radial sections of the air conducting conduit (32) are formed by two beveled sections of the insert body, the beveled sections being sloped from adjacent the front wall longitudinally toward each respective side wall and toward the rear wall and toward the mounting surface so that the radial sections of the air conduit run from the outlet of the insert body at a point adjacent the front wall (5) to the longitudinal side walls (3', 3'') rearwardly toward the mounting surface (50), the longitudinal side walls being provided with air outlets (33', 33'').

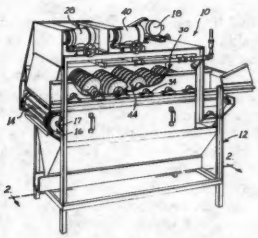
4,611,532
FOOD PEELER

Kim W. Trinkley, 51393 Simmons, South Bend, Ind. 46637

Continuation of Ser. No. 372,031, Apr. 26, 1982, abandoned. This application Oct. 14, 1983, Ser. No. 542,142

Int. Cl.[4] A23N *7/00*

U.S. Cl. 99—628 **2 Claims**



1. In a peeling remover for food items such as fruits and vegetables, said remover including a frame, an endless belt means for conveying said food items longitudinally across said frame, twisting means journaled in said frame and extending transversely of said belt means for abrasively contacting said food items being conveyed upon said belt means and urging the food items transversely over the belt means, the improvement wherein said twisting means includes a spiral blade located adjacently above said belt means for receiving said food items between the turns of said blades, said blade having abrasive food item contacting surfaces and being flexible to provide yieldable resistance for said food items, a plurality of said twisting means spaced longitudinally along said belt means, each twisting means having its blade turn oppositely from the blade of the adjacent twisting means.

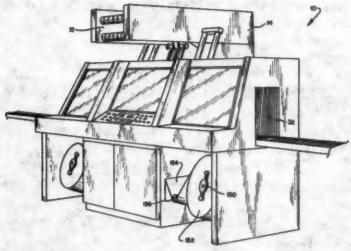
4,611,533
TYING APPARATUS

Leonard Miaskoff, and Richard J. Merwarth, both of Plattsburgh, N.Y., assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Jun. 27, 1985, Ser. No. 749,561

Int. Cl.[4] B65B *13/20*

U.S. Cl. 100—7 **15 Claims**



1. An apparatus for sequentially tying loose stacks of signatures, said apparatus comprising a central station, a first tying station disposed adjacent a first side of said central station, a second tying station disposed adjacent a second side of said central station, a first receiving station disposed adjacent to a side of said first tying station opposite from said central station,

a second receiving station disposed adjacent to a side of said second tying station opposite from said central station, track means extending from said first receiving station through said first tying station, central station and second tying station to said second receiving station, said track means including first surface means for defining a first gap in said track means at said first tying station and second surface means for defining a second gap in said track means at said second tying station, shuttle means for sequentially pushing stacks of signatures from said central station to said tying and receiving stations, drive means for reciprocating said shuttle means along said track means, said drive means being operable to move said shuttle means in a first direction to move a loose stack of signatures to said first tying station and to move a tied stack of signatures to said first receiving station, said drive means being operable to move said shuttle means in a second direction to move a loose stack of signatures to said second tying station and to move a tied stack of signatures to said second receiving station, first tying means at said first tying station for sequentially moving bands though said first gap in said track means and tying the bands around loose stacks of signatures at said first tying station, and second tying means at said second tying station for sequentially moving bands through said second gap in said track means and tying the bands around loose stacks of signatures at said second tying station.

4,611,534

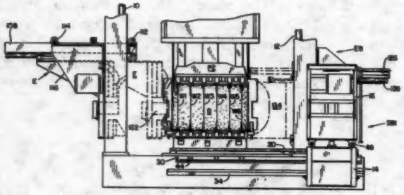
BALE STRAPPING APPARATUS

Mark L. Kudlicka, Lake Oswego, and Albert E. Cranston, III, Wilsonville, both of Oreg., assignors to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Apr. 8, 1985, Ser. No. 720,691

Int. Cl.[4] B65B *13/04*

U.S. Cl. 100—26 **11 Claims**



1. Apparatus for strapping bales of material comprising a pair of structurally separate side binders movable along opposite sides of the bale to a series of strapping stations, each of said side binders comprising a carriage section running on a carriage track alongside the bale and a strapping section movable on said carriage section by power means in a direction toward and away from the adjacent side of the bale.

4,611,535

CYLINDRICAL BALE-FORMING PRESS WITH TORQUE-LIMITING DEVICE

Henry D. Anstey, Ottumwa, Iowa, and Jean Viaud, Sarreguemines, France, assignors to Deere & Company, Moline, Ill.

Filed Jan. 28, 1985, Ser. No. 695,318

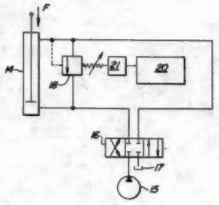
Claims priority, application European Pat. Off., Jan. 27, 1984, 84400187.5

Int. Cl.[4] B30B *5/06*; A01D *39/00*

U.S. Cl. 100—43 **5 Claims**

1. A press for forming cylindrical or round bales, comprising sets of endless flexible elements which define a chamber for forming a bale by rolling up, and pass over guide rollers at least one of which is driven from a main driving shaft, some of these guide rollers being movable tensioning rollers which are subjected to the action of biasing means for maintaining the belts under tension, characterized in that a torque sensor is provided on the main driving shaft of the press and includes an output signal means for generating an electrical signal indicative of a torque exceeding a predetermined limit value;

electrically responsive bias relief means connected to receive the output signal of said torque sensor and being



operable for acting on said biasing means of the tensioning rollers so as to adjust said biasing means in a sense that will reduce the tension of the belts when the resisting torque on the driving shaft of the press increases above said predetermined limit value.

4,611,536

APPARATUS FOR PRODUCING A RESET PULSE FOR A PRINTER

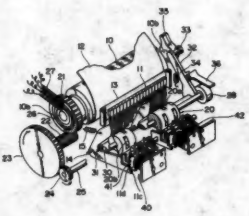
Mikio Moriya, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 697,030

Claims priority, application Japan, Jan. 31, 1984, 59-011122[U]

Int. Cl.[4] B41J *1/24*

U.S. Cl. 101—93.21 **3 Claims**



1. In an apparatus for producing a reset pulse for performing a printing operation of an impact printer, the printer having a type drum, a plurality of hammers urged by springs to the type drum, a plurality of electromagnets for holding the hammers in retracted positions and for releasing the hammers by a signal dependent on the reset pulse, and a reset cam for operating a reset switch for moving each hammer to perform said printing operation, the improvement comprising:

a reset lever provided to be rocked;

a reset cam secured to a shaft of the type drum, said cam having an actuating portion and an escape portion, both portions being different in cam lift;

a cam follower mounted on said reset lever to engage with said cam, said cam follower having a large diameter portion and a small diameter portion corresponding to said actuating portion and escape portion; and

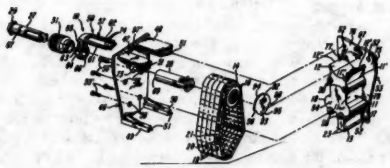
a reset switch provided to be operated by said reset lever to produce a reset pulse when rocked by the engagement of said cam follower with the actuating portion of said cam, said cam follower being detachably attached to said reset lever so as to be attached in reverse, whereby print timing is changed.

4,611,537

PRINT HEAD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 19, 1984, Ser. No. 672,660
Int. Cl.[4] B41J 1/60
U.S. Cl. 101—111 5 Claims



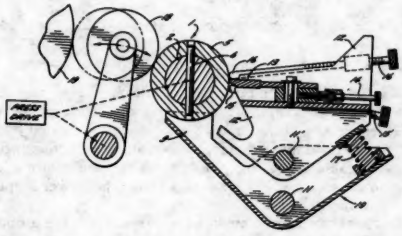
1. A print head, comprising: a longitudinally extending mounting block having spaced end portions and internal coring, the mounting block being of molded plastics construction and including an elongate mounting surface extending between the end portions, a series of drive wheels rotatably supported on the mounting surface, means for supporting printing bands at a printing position, a series of printing bands trained about the drive wheels and the supporting means, the mounting block further including a first end plate molded integrally with one end portion and extending transversely of the mounting block, a second end plate molded integrally with the other end portion and being in alignment with the internal coring, wherein the wheels have aligned holes defining an axially extending opening, and a third end plate secured to the second end plate, the third end plate having an opening, and a selector received in the opening in the third end plate and received in the axially extending opening for selectively driving any drive wheel.

4,611,538

INKING UNIT FOR A PRINTING MACHINE

Claus Simeth, Offenbach, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,668
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400831
Int. Cl.[4] B41F 31/04, 31/14
U.S. Cl. 101—365 13 Claims



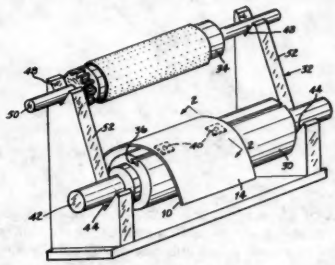
1. An inking unit for a printing machine comprising, in combination, a duct roller and a duct unit adapted to be set against the duct roller, the duct unit having a plurality of ink metering elements the distance of which from the duct roller can be adjusted independently of one another, characterized in that said duct unit includes a carrier duct mounted directly on the duct roller, a plurality of adjacent duct segments respectively mounted individually for limited pivoting movement on the carrier duct and each duct segment forming an intermediate carrier for at least some of the ink metering elements.

4,611,539

DEVICE AND METHOD FOR THE PRECISION MOUNTING OF FLEXIBLE PRINTING PLATES

Carl Ireton, 3189 Sunny Crest La., Kettering, Ohio 45419

Filed Sep. 30, 1985, Ser. No. 781,455
Int. Cl.[4] B41C 1/02
U.S. Cl. 101—401.1 18 Claims



1. A method of producing a flexible printing plate for mounting on a plate roller that rotates about an axis; the printing plate being adapted to be made by means of a photographic process to produce a printing surface, and having locating apertures in the printing plate, said plate being designed to cooperate with locator means having guide pins thereon, for controlling the position of the printing plate when it is temporarily carried on said locating pins, said plate being supported on said locator means for subsequent transfer of the printing plate to said plate roller comprising the steps of photographically producing the printing surfaces on the face of said printing plate, simultaneously photographically producing spaced apart locator apertures on the printing face of said plate during said photographic processing, whereby said printing areas and said locator apertures are precisely photographically positioned the one relative to the other and said locator apertures in said plate can be assembled on the locating pins of said locator means in order that the raised printing surfaces can be precisely mounted on said plate roller.

4,611,540

MORTAR AMMUNITION

Rolf T. Pettersson; Hans G. U. Edlund, and Bengt I. C. Regebro, all of Eskilstuna, Sweden, assignors to Affarsverket FFV, Eskilstuna, Sweden

Filed Feb. 7, 1984, Ser. No. 577,708
Claims priority, application Sweden, Feb. 9, 1983, 8300662
Int. Cl.[4] F42B 15/00
U.S. Cl. 102—372 3 Claims

1. Mortar ammunition for a mortar having a barrel, said mortar ammunition comprising:

a projectile body,

a tail tube for containing a propellant charge,

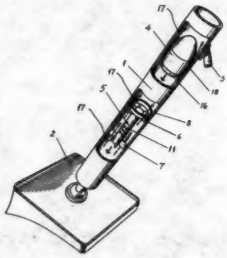
an annular girdle,

attachment means for securely attaching said annular girdle and said tail tube,

said tail tube attached to said annular girdle and said projectile body constitute two separate components which, for the purpose of being loaded into the mortar, are lowered in turn into the mortar via a muzzle of its barrel until said projectile body and said annular girdle come into contact with each other inside the barrel, and

mounting means for mounting said annular girdle on said projectile body, said mounting means including an annular

shoulder defined by a rear end of the projectile body for engaging in and making contact with said girdle when the projectile body is lowered towards the tail tube in the barrel, said mounting means further including a portion of said annular girdle which corresponds in shape to the external shape of the annular shoulder, and under the



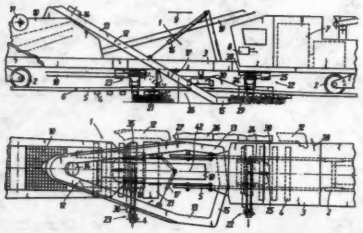
effect of gases produced when the propellant charge is ignited, said annular girdle ruptures its attachment with the tail tube and at the same time mounts itself securely on said annular shoulder of the projectile body so that the girdle is carried by the projectile body out of the barrel of the mortar.

4,611,541

BALLAST CLEANING METHOD AND MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Nov. 23, 1984, Ser. No. 674,003
Claims priority, application Austria, Jan. 31, 1984, 311/84
Int. Cl.[4] E01B *27/10*
U.S. Cl. 104—2 **8 Claims**



5. A machine for cleaning ballast supporting a railroad track consisting of two rails fastened to a succession of ties, successive ones of the ties defining cribs therebetween and the track having a longitudinal axis extending centrally between the rails, which comprises

(a) a frame supported on two spaced apart undercarriages for continuously advancing along the track in an operating direction,

(b) an endless ballast excavating and conveying chain laterally and vertically pivotally supported on the machine for continuously and sequentially excavating the ballast, receiving and delivering the excavated and conveyed ballast along the track axis to a ballast cleaning installation on the machine, the chain including a transverse ballast excavating stringer extending below the track and the ballast being separated into a cleaned component and a waste component in the ballast cleaning installation,

(c) laterally pivotal conveyor means for returning the cleaned component to a section of the track which has been excavated by the chain stringer immediately behind the stringer in the operating direction,

(d) conveyor means for removing the waste component, and the improvement comprising

(e) means for removing a number of the ties between the undercarriages along a section of the track ahead of, at and behind an obstacle extending along a shoulder of the track while the machine continuously advances,

(f) hydraulically operated drive means for selectively laterally pivoting the excavating chain ahead of the obstacle into selected positions wherein a respective end of the transverse excavating chain stringer is immediately adjacent a respective one of the rails adjacent the shoulder to move the transverse ballast excavating chain stringer away from the obstacle towards the track axis and for laterally pivoting the excavating chain behind the obstacle until the transverse excavating chain stringer is substantially centered with respect of the track axis,

(g) means for continuously re-inserting the ties in said section of the track where the ties are supported on the cleaned ballast component, said means comprising

(1) tie replacement devices arranged, respectively, immediately ahead of the transverse ballast excavating chain stringer, in the operating direction, and adjacent an output end of the laterally pivotal conveyor means, each tie replacement device comprising a base plate, a telescopingly displaceable strut connected to the base plate, a carrier plate mounted on guides on the base plate for vertical displacement, a pair of pivotal tie clamping tongs mounted on the carrier plate, the base plate and the carrier plate being spaced from each other in a direction transverse to the machine frame, and a vertical displacement drive arranged between the plates, and

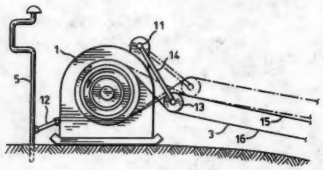
(h) guide means on the machine frame supporting the tie replacement devices for longitudinal displacement thereon.

4,611,542

PERSONALIZED TOWING DEVICE

Anatoly Pivarunas, 2700 Bathurst St., Apt. 815, Toronto, Ontario, Canada M6B 2Z7

Filed Oct. 31, 1984, Ser. No. 666,768
Int. Cl.[4] B61B *11/00*; B66D *1/48*
U.S. Cl. 104—173 ST **3 Claims**



1. A portable towing device comprising:

a drive unit comprising a motor and a drive pulley connected to said motor by a rotor which is rotated by said motor, said motor having an actuator, said actuator being moveable from an idle position wherein said motor idles to an increased power position wherein the power output of said motor is increased;

first anchor means to anchor said drive unit in the ground in a stationary position;

second anchor means engageable in the ground at a distance from the drive unit and having a support pulley connected thereto;

an endless cable extending between said entrained about said drive pulley and said support pulley, having an upper portion and a lower portion; and

switching means connected to said actuator at one end and to said upper and lower portions of said cable at the other

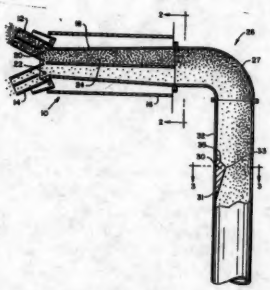
end, said switching means operable to move said actuator to said idle position when the tension of each of said portions of said cable on said pulley are equal and to move said actuator to an increased power position when the tension of said portions of said cable are unequal.

4,611,543

RESTRICTOR APPLICATION FOR IN LINE GAS ENTRAINED SOLIDS REDISTRIBUTION

Robert J. Collette, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 17, 1981, Ser. No. 331,697
Int. Cl.⁴ F23K *3/02*
U.S. Cl. 110—263 **3 Claims**



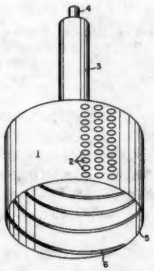
1. In combination a burner, a first substantially horizontal fuel pipe for conveying a mixture of air and pulverized coal to the burner, a second substantially vertical fuel pipe for conveying the mixture to the first pipe, an elbow joining the first pipe to the second pipe, said elbow having an inner radius and an outer radius, the improvement comprising a restriction in the second pipe, being located such that it forces the coal particles towards the outer radius of the elbow, thereby reducing impact wear on the outer radius wall of the elbow, and a substantially horizontal plate means separating the first pipe along its longitudinal axis, so as to form a first upper passage, and a second lower passage, so that a high density stream flows through the upper passage, and a low density stream flows through the lower passage.

4,611,544

BURNER FOR PARTICULATE FUEL

Olav Thrap-Olsen, Älgvägen 13, Lidingö , Sweden S-181 43

Filed Nov. 13, 1984, Ser. No. 670,829
Claims priority, application Sweden, Nov. 16, 1983, 8306289
Int. Cl.⁴ F23B *7/00*
U.S. Cl. 110—341 **7 Claims**



1. A method for combusting solid fuel in particulate form wherein fuel and air are supplied to a combustion chamber within which combustion occurs in a bed, wherein:

(i) said combustion chamber has a substantially cylindrical wall and is rotated at a rate to generate sufficient centrifugal force to maintain said bed against said wall and

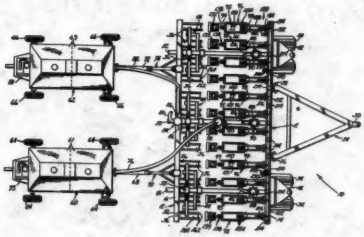
(ii) the rotation of said combustion chamber is interrupted at periodic intervals such that the rotational speed will slow at least sufficiently that the bed will release from said wall during said intervals and skid along it.

4,611,545

CONSERVATION NO TILL FARMING APPARATUS

James L. Nickeson, Veblen, S. Dak., and John A. Walko, Fargo, N. Dak., assignors to Concord, Inc., Fargo, N. Dak.

Filed Jan. 19, 1984, Ser. No. 572,218
Int. Cl.⁴ A01C *5/00*
U.S. Cl. 111—52 **26 Claims**



1. A conservation no till apparatus for distributing fertilizer and seed into the ground in one operation as moved through the field by a traction vehicle, the apparatus comprising:

a main implement frame having ground engaging support wheels;

first hopper means for carrying fertilizer;

second hopper means for carrying seed;

means for supporting said first and second hopper means separately from the main implement frame at all times;

a plurality of ground working units mounted with respect to the main implement frame;

linkage means for separately mounting the units with respect to the main implement frame in lateral spaced relation;

means for simultaneously moving the units with respect to the main implement frame between a raised transport position and a lower ground engaging position, with the linkage means permitting each unit to move vertically independently of the other units when the units are in the ground engaging position so that each unit can independently follow the contour of the ground being worked;

each ground working unit including:

a unit frame,

first furrow opening means mounted with respect to the unit frame for engaging the ground and creating a first furrow when the unit it in its ground engaging position,

first means for dispensing fertilizer from the first hopper means into the first furrow,

second furrow opening means mounted with respect to the unit frame for engaging the ground and creating a second furrow spaced laterally from the first furrow when the unit is in its ground engaging position,

second means for dispensing seed from the second hopper means into the second furrow,

first compaction means mounted to the unit frame for compacting the ground adjacent only the second furrow immediately after seed has been dispensed therein,

height adjustment means on the unit frame for controlling the depth of penetration of the first and second furrow opening means into the ground, and

weight adjustment means on the unit frame for controlling

the force of penetration of the first and second furrow opening means into the ground; and

second compaction means mounted to the main frame and aligned for further compacting the ground adjacent the second furrow after compaction thereof by the first compaction means.

4,611,546

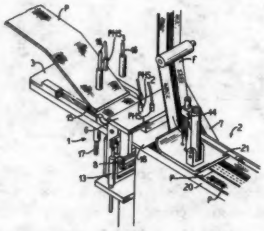
APPARATUS FOR ATTACHING FLY STRIPS TO A SLIDE FASTENER CHAIN

Kazuo Miyakawa, Marietta, Ga., assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,543

Int. Cl.[4] D05B *3/12*

U.S. Cl. 112—121.27 **18 Claims**



1. Apparatus for automatically feeding successive individual pieces to a continuously operating sewing machine for sewing, comprising a sewing machine, means for commencing sewing of a preceding piece in said sewing machine, means for supporting a leading end of a succeeding piece in superimposed relation over a trailing end of said preceding piece being sewn, a stop upstream of said sewing machine for keeping said succeeding piece waiting for supply to said sewing machine, feed roll means for supplying said succeeding piece to said sewing machine for sewing, and a detector for detecting when the trailing end of said preceding piece advances out from under the leading end of said succeeding piece and then engaging means for releasing said stop and energizing said feed roll means to supply said succeeding piece to said sewing machine for sewing.

7. Apparatus for automatically attaching successive fly strips to a continuous length slide fastener chain, comprising a sewing machine, means for feeding the slide fastener chain to said sewing machine, and a feed station for supplying the fly strips one after another along a substantially horizontal path to said sewing machine, said feed station having a guide for directing the fly strips to said sewing machine, a pair of feed rollers disposed at opposite sides of said guide for feeding the fly strips along said guide to said sewing machine, a vertically movable stop, disposed above said guide between said feed rollers and sewing machine, for keeping a succeeding fly strip waiting and superimposed over a preceding fly strip being sewn, a detector disposed between said stop and sewing machine for detecting when the trailing end of said preceding fly strip advances out from beneath the leading end of said succeeding fly strip, and means operable in response to detection by said detector for engaging said feed rollers and releasing said stop to cause said succeeding fly strip to be passed to said sewing machine for sewing.

4,611,547

UPPER THREAD TENSION DEVICE OF A SEWING MACHINE

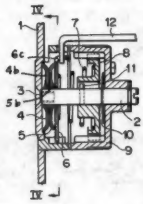
Hidechika Kuramoto, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Kyobashi, Japan

Filed Jun. 13, 1985, Ser. No. 745,003

Claims priority, application Japan, Jun. 13, 1984, 59-86694[U]; Jun. 13, 1984, 59-86695[U]

Int. Cl.[4] D05B *47/02*

U.S. Cl. 112—254 **2 Claims**



1. A thread tension device of a sewing machine having a fabric presser bar, and a fabric presser bar lifting lever operatively connected to the fabric presser bar and operated in one way to shift the fabric presser bar away from a fabric to be sewn and in another way to shift the fabric presser bar toward the fabric, said thread tension device comprising a mount plate fixedly arranged in the sewing machine; a support shaft having one end secured to said mount plate; thread tensioning means including a pair of thread tensioning disks coaxially mounted on said support shaft and having concentrically arranged curved thread clamping faces adapted to be pressed against each other to clamp therebetween an upper thread of the sewing machine; spring means progressively operated with respect to said pair of thread tensioning disks to adjustably press said disks against said mount plate; thread tension adjusting means operated to progressively increase or decrease, respectively, an elastic force of said spring means to thereby adjust a thread clamping pressure between the thread clamping faces of said thread tensioning disks; a substantially vertical oriented actuating means provided between said spring means and said pair of thread tensioning disks to press one of said thread tensioning disks against said mount plate and press the other of said thread tensioning disks against said one thread tensioning disk; and transmission means including a transmission rod having one end operatively connected to said actuating means and other end operatively connected to said fabric presser bar lifting lever, said transmission rod being operated by the fabric presser bar lifting lever when the latter is operated in said one way so as to actuate said actuating means to depart from said substantially vertical orientation to thereby turn said other thread tensioning disk axially of said support shaft on a fulcrum provided by an end portion of said curved thread clamping face of said other thread tensioning disk, so as to move a diametrically opposite end portion of said thread clamping face of said other thread tensioning disk away from said one thread tensioning disk.

4,611,548

TOP TRANSPORT FOR SEWING MACHINES

Helmar Holl, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 782,283

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435633

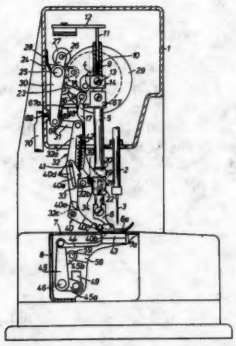
Int. Cl.[4] D05B *27/06*

U.S. Cl. 112—311 **6 Claims**

6. A top transport feed for a sewing machine having a base and a spring loaded presser bar with a presser foot which may

be moved into and out of association with material being fed by a feed drive over the base of the sewing machine,

comprising a seating displaceably mounted on the presser bar, a top transport foot alongside the presser bar, a two armed top transport rocker driven by the feed drive and



carrying said top transport foot, said two armed top transport rocker being connected to said seating for movement with movement of said seating, a bearing piece secured on said presser bar, an articulated link mechanism connected between said bearing piece and said seating and having a joint, and a lifting drive connected to said joint.

4,611,549

ROTATION CONTROL SYSTEM FOR Z-TYPE PROPULSION APPARATUS

Masanori Kodera, Chigasaki; Yasuo Aizawa, Hiratsuka, and Kohji Ichijo, Tokyo, all of Japan, assignors to Niigata Engineering Co., Ltd., Japan

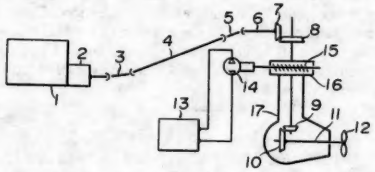
PCT No. PCT/JP84/00158, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/03871, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 30, 1984, Ser. No. 682,009

Claims priority, application Japan, Mar. 30, 1983, 58-46140[U]; Sep. 29, 1983, 58-181333; Oct. 3, 1983, 58-184885; Mar. 26, 1984, 59-57562

Int. Cl.[4] B63H *5/14*

U.S. Cl. 114—144 E **7 Claims**



1. A rotation control system comprising a steering angle detector means for detecting a steering angle of a steering handle which causes a hollow rotary housing of a Z-type propulsion apparatus to rotate, a rotation angle detector means for detecting a rotation angle of the rotary housing, a difference-of-angle detecting means for detecting a difference between the steering angle and the rotation angle, a drive device for rotating the rotary housing, a load detector means for detecting the load of the drive device, and a drive control means for limiting the output of the difference-of-angle detecting means in accordance with the output of the load detector means so as to control the drive device in accordance with the limited output.

4,611,550

SYSTEM FOR MOORING TANKERS TO A FIXED STRUCTURE

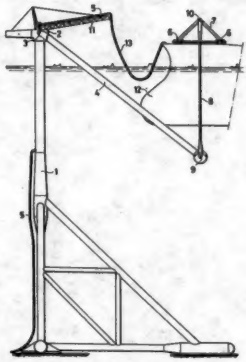
Vincenzo Di Tella; Roberto Brandi, and Roberto Carraro, all of Padua, Italy, assignors to Tecnomare S.p.A., Venice, Italy

Filed Aug. 8, 1984, Ser. No. 638,673

Claims priority, application Italy, Aug. 12, 1983, 84135 A/83

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **4 Claims**



1. An improved system for mooring tankers to an emergent fixed structure fixed to the sea bed, comprising an articulated structure for connecting the tanker to the fixed structure, said structure including an equalizer hinged to the tanker deck by hinges able to isolate said articulated connection structure from the tanker rolling motion, said structure also including a swinging boom made up of ballast chamber, said swinging boom in said articulated connection structure is constituted by tubular rods and said structure further includes two ties hinged to said swinging boom.

4,611,551

SNORKEL MAST FOR A SEMI-SUBMERSIBLE VEHICLE

James S. Ferguson; J. Eric Jackson, and Isaac B. Brower-Berkhoven, all of c/o International Submarine Engineering Ltd., 2601 Murray Street, Port Moody, British Columbia, Canada

Filed Dec. 14, 1984, Ser. No. 681,683

Int. Cl.[4] B63G *8/04*

U.S. Cl. 114—339 **2 Claims**

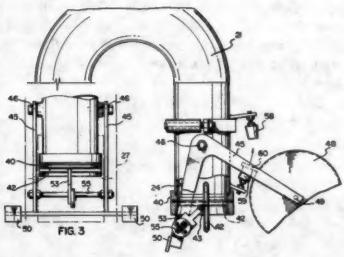


FIG. 3

1. A snorkel valve closure mechanism comprising a valve seating member mounted at the open end of an inverted U-shaped snorkel head pipe section; a butterfly valve pivoted at

said open end; a bell-crank lever pivotally mounted on said snorkel head pipe section above said valve seating member; a connecting operating link between said bell-crank lever and said butterfly valve; float means at one end of said bell-crank lever and water impact flap means at the other end of said bell-crank lever whereby said butterfly valve may be pivoted into valve closing engagement with said seating member by the action of water flowing past said valve mechanism or by a float lifting action of water lever relative to said float means.

4,611,552

BOARDING STEPS

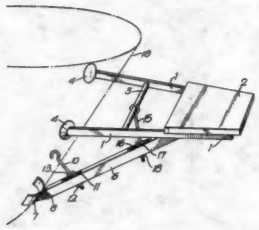
Leo Koppelomäki, Almgatan 23, S-333 00 Smålandsstenar, Sweden

Filed Oct. 23, 1984, Ser. No. 663,746

Claims priority, application Sweden, Nov. 23, 1983, 8306458

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—343 **7 Claims**



1. A boarding step for mounting on a boat comprising, a tread platform; a first abutment member adapted to be in contact with the boat below said platform; a strut member connecting said platform and said first abutment member; a carrier arm connected to said platform and fastening means adapted for fastening said boarding step to a boat, said strut member being connected to said platform by means of first adjustment means thereby permitting the strut member to pivot, said carrier arm having second abutment means adapted for contacting the boat, said carrier arm and said strut member being interconnected by means of a second adjustment means to enable the angular positioning of the strut member and the carrier arm, and said fastening means being connected to the strut member above said first abutment member and adapted to urge said first and second abutment members against a boat.

4,611,553

SUCTION NOZZLE

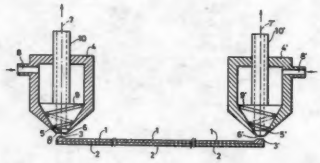
Isamu Iwata; Hirotaro Hosoe, and Yuji Matsuoka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1984, Ser. No. 649,800

Claims priority, application Japan, Sep. 12, 1983, 58-141123[U]

Int. Cl.[4] B05C *11/02, 11/06*

U.S. Cl. 118—50 **5 Claims**



1. In a suction nozzle having a dual pipe structure with a cleaning liquid jetting outlet and a cleaning liquid sucking inlet at an end thereof, the improvement therein:

said jetting outlet is offset from a longitudinal axis of said nozzle and forms an angle in a range of 30° to 85° with respect to a line parallel to said axis and intersecting said outlet; and

said sucking inlet is located on said axis.

4,611,554

METHOD AND DEVICE FOR THE TREATMENT OF PRINTED CIRCUIT BOARDS

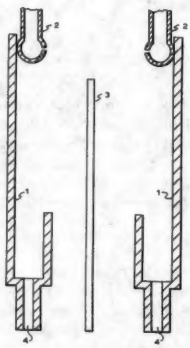
Hartmut Mahlkow, and Horst Bläsing, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,639

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406583

Int. Cl.[4] H05K *3/14, 3/42*

U.S. Cl. 118—316 **8 Claims**



1. A device for the treatment of printed circuit boards with process solutions, comprising a container for collecting a treatment solution, a continuous conveyor for continually moving the boards vertically above said container; nozzles for applying a treatment solution to the boards being treated; tubular conduits connected to said nozzles and to said container for conveying a treatment solution to the nozzles; and two similar receivers positioned above said container and below said nozzles and arranged in mirror-inverted relationship relative to each other, said receivers being positioned at two sides of the board being treated and parallel to the direction of moving the boards, each receiver having at a lower end an outlet opening, an inner side wall facing the board being treated and an outer wall facing away from the board, said inner wall being shorter than said outer wall.

4,611,555

SPREADER FOR PARTICULATE MATERIAL

Charles E. Burford, Maysville, Okla., assignor to Burford Corp., Maysville, Okla.

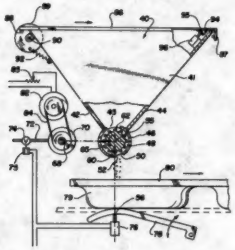
Filed Mar. 29, 1983, Ser. No. 480,027

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—684 **6 Claims**

1. Apparatus for dispensing particulate material to spread the particulate material over an array of food products comprising: a dispensing tube having a hollow bore, said tube having inlet and outlet passages; a round elongated shaft in said hollow bore, said shaft having spaced dispensing sections separated by spaced blocking sections; a drive coupling on at least one end of said shaft, said coupling being connectable to an intermittently driven shaft; drive means drivingly connected to said driven shaft; sensor means positioned to energize

said drive means when a food product to receive particulate material is positioned in a predetermined relationship relative to said outlet passage and to de-energize said drive means when the food product is moved away from said predetermined position; said blocking sections comprising blocking collars, external spline teeth formed on each of said dispensing sections of said shaft, said spline teeth having a major diameter equal to the diameter of said blocking collars less a distance in a range



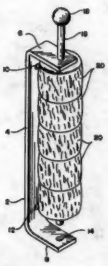
of from 3 to 4 times the diameter of the particles of material to be dispensed such that when said shaft is rotated inside said hollow tube having an inside diameter approximately equal to the outside diameter of the blocking collars an arcuate annular dispensing passage is formed, whereby the spacing between the inner wall of the tube and the major diameter of the spline teeth is in a range of 1¼ to 2 times the diameter of particles of particulate material being dispensed.

4,611,556

CAT SCRATCHING POST AND DOOR HANGING ASSEMBLY

Lawrence Frank, 784 Columbus Ave. 17J, New York, N.Y. 10025

Filed May 16, 1985, Ser. No. 734,601
Int. Cl.⁴ A01K *29/00*
U.S. Cl. 119—29 **13 Claims**



9. A cat scratching post assembly, comprising:

(a) support means,

(b) an elongated mounting rod supported by said support means at two longitudinally spaced points and from which it is readily retracted,

(c) a series of stackable, generally cylindrically-shaped cork elements each having a central axial passage along which they are axially mounted upon said mounting rod in free sliding engagement,

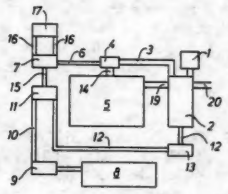
(d) said cylindrically-shaped elements being readily removable from the mounting rod and interchangeably re-positioned upon said mounting rod, said support means extending between said two spaced points.

4,611,557

INTERNAL-COMBUSTION ENGINE

Kurt Hierzenberger, Leoben, Austria

Filed Sep. 27, 1985, Ser. No. 781,436
Claims priority, application Austria, Sep. 28, 1984, 3094/84
Int. Cl.⁴ F02M *25/02*
U.S. Cl. 123—25 B **17 Claims**



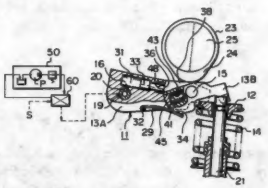
1. An internal-combustion engine comprising at least one combustion chamber to which a dispersion of fuel and water is supplied via a dispersion supply conduit and to which is supplied the air required for the combustion and which is in connection with an exhaust gas conduit serving for the removal of the exhaust gases and vapors generated during the combustion, a heat exchanger being interconnected into said exhaust gas conduit, condensation of the water contained in the exhaust gases and vapors taking place in said heat exchanger with simultaneous heating of the air required for the combustion, noting that a condensate collecting chamber for receiving the condensed water is provided and connected with the entry side of a dispersing means via a condensate supply conduit, the fuel supplied via a fuel supply conduit being dispersed with water within this dispersing means, the outlet side of which is in connection with the dispersion supply conduit.

4,611,558

VALVE ACTUATING APPARATUS IN INTERNAL COMBUSTION ENGINE

Kouji Yoshizaki, and Toshio Tanahashi, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 20, 1985, Ser. No. 778,304
Claims priority, application Japan, Oct. 12, 1984, 59-153107[U]; Jan. 21, 1985, 60-5319[U]; Feb. 13, 1985, 60-17693[U]; Feb. 16, 1985, 60-19989[U]
Int. Cl.⁴ F02D *13/06*
U.S. Cl. 123—90.16 **12 Claims**



1. A valve actuating apparatus for intake and exhaust valves in an internal combustion engine having a swing rocker arm which is rotatably connected at its one end to a rocker arm shaft and at its opposite end bears against a valve stem of an associated intake or exhaust valve, and a rotatable cam which bears against the swing rocker arm to swing the latter about the rocker arm shaft, wherein said rocker arm is composed of a first arm which is rotatably connected to the rocker arm shaft and a second arm which bears against the valve stem and which is connected to the first arm by means of a connecting shaft extending in parallel to the rocker arm shaft, for relative rotation about the connecting shaft so that the two arms can selectively occupy an operative position in which the two arms

are integral with each other and extend substantially straight so as to form a single rocker arm, and an inoperative position in which a relative rotation between the two arms takes place to absorb the rotation of the cam, and wherein said apparatus comprises locking means for preventing the relative rotation of the two arms to lock them to the operative position, unlocking means for releasing the lock at a predetermined time, and return means for continuously biasing the two arms toward the operative position to return them to the operative position when the lock is released, said locking means and unlocking means having directions of operation substantially perpendicular to and across the axis of the connecting shaft.

4,611,559

OUTBOARD MOTOR PROVIDED WITH A FOUR-STROKE ENGINE

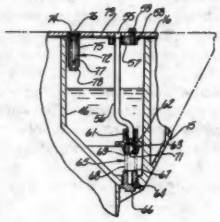
Yukio Sumigawa, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Sep. 12, 1984, Ser. No. 650,291

Claims priority, application Japan, Sep. 13, 1983, 58-167425; Sep. 13, 1983, 58-167426

Int. Cl.⁴ F01M *1/00*

U.S. Cl. 123—196 A **17 Claims**



1. In a lubricating system for an internal combustion engine having a lubricant reservoir adapted to contain a lubricant for said engine, an inlet line depending into said lubricant reservoir for supplying lubricant for an engine lubricating system, a strainer disposed at the inlet end of said inlet line for removing foreign particles from the lubricant entering said inlet line, a drain opening in said lubricant reservoir for draining lubricant therefrom, and a drain plug for closing said drain opening, the improvement comprising said drain opening and said strainer being sized and related for servicing of said strainer through said drain opening, and relief valve means for bypassing the strainer in providing unfiltered lubricant to the inlet line in the event the strainer becomes plugged.

4,611,560

IDLING SPEED CONTROL SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Masaaki Miyazaki; Mitsuaki Ishii; Hajime Kako, all of Himeji; Noboru Nakamura, Kyoto, and Hideo Kakinuma, Kusatsu, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP84/00175, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984

PCT Filed Apr. 7, 1984, Ser. No. 681,855

Claims priority, application Japan, Apr. 8, 1983, 58-62530; Apr. 8, 1983, 58-62531

Int. Cl.⁴ F02D *11/10*

U.S. Cl. 123—339 **4 Claims**

1. An idling speed control system of an internal combustion engine comprising:

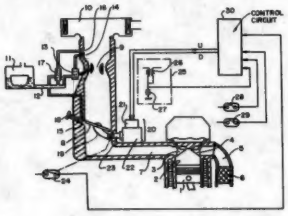
a valve device which controls the amount of intake air for the engine;

an actuator which includes an electric motor for variably controlling the opening of said valve device;

rotation speed detector means for detecting the rotation speed of the engine;

idling condition detector means for detecting the idling condition of the engine;

feedback control means responsive to the detected output of said idling condition detector means for generating feedback control pulses to intermittently drive said electric



motor so that said detected rotation speed of the engine under the idling condition may converge into a target idling rotation speed; and

control means responsive to the output of detector means that detects an abnormally low rotation speed of the engine detected by said rotation speed detector means for generating control pulses that do not overlap said feedback control pulses to drive said electric motor in a predetermined direction.

4,611,561

AUTOMATIC SPEED CONTROL SYSTEM FOR MOTORCYCLES

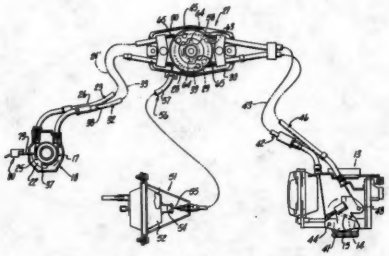
Koji Suyama, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 29, 1984, Ser. No. 645,485

Claims priority, application Japan, Aug. 31, 1983, 58-160039

Int. Cl.⁴ F02D *11/08, 41/14*

U.S. Cl. 123—360 **5 Claims**



1. An automatic speed control mechanism for a motorcycle or the like comprising a throttle operable in opening and closing directions for controlling the speed of the motorcycle, an operator actuated speed control movable in an opening and closing direction, connecting means including a rotatable control element and separate opening means and closing means for positively coupling said operator actuated speed control to said rotatable control element for positively rotating said control element in throttle opening and closing directions, separate opening and closing means for positively coupling said control element to said throttle for positively opening and closing said throttle, actuator means for automatically positioning said throttle, said actuator means being operative to drive an actuator element rotatable relative to said control element, and

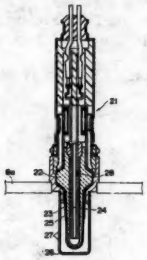
means for providing a lost motion connection between said actuator element and said control element for permitting movement of said control element independently of said actuator element and for operation of said control element by said actuator element upon movement of said actuator element by said actuator means.

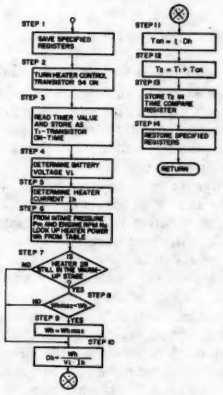
4,611,562

METHOD AND SYSTEM FOR INTERNAL COMBUSTION ENGINE OXYGEN SENSOR HEATING CONTROL WHICH PROVIDE SENSOR HEATING LIMITED FOR RELIABLE OPERATION

Jiro Nakano; Takao Ishibashi; Takao Akatsuka, and Masao Kawaguchi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 30, 1984, Ser. No. 666,470
Claims priority, application Japan, May 7, 1984, 59-90680
Int. Cl.⁴ F02M *7/00*; G01N *27/46*
U.S. Cl. 123—440 **14 Claims**





1. For an internal combustion engine comprising an exhaust system and an oxygen sensor fitted to said exhaust system, said sensor comprising a sensor element, an electrically powered resistive heater for heating said sensor element, and a source of electrical power to said heater:

a method for controlling a value of electrical power supplied from the source to said heater, said method comprising the steps of:

controlling the electrical power supplied to said heater according to engine operational parameters; and

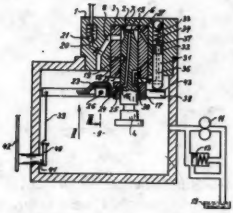
restricting the controlled electrical power supplied to said heater less than a predetermined maximum tolerable value when and only when said heater is not warmed to a predetermined active temperature.

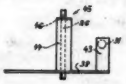
4,611,563

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Manfred Bauer, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 678,009
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400347
Int. Cl.⁴ F02M *37/04*
U.S. Cl. 123—449 **5 Claims**





1. A fuel injection pump for supplying fuel to self-igniting internal combustion engines, comprising housing means in which a pump piston is inserted for a reciprocal and rotary movement, said piston defining with said housing means at least one pump work chamber, said housing means further having a suction chamber and a relief conduit leading at least partly through said housing means from said suction chamber to said pump work chamber, said pump work chamber being supplied with fuel from said suction chamber during a suction stroke of said piston; a control slide positioned in said housing means and displaceable for blocking or throttling said relief conduit partly leading through said housing means thereby controlling an outflow of a partial quantity of fuel in the pump, said control slide being arbitrarily displaced; a rocker lever which serves to arbitrarily actuate said control slide; a restoring spring for biasing said control slide; an adjusting lever actuated from outside of said housing means, said rocker lever having one arm which engages said control slide and another arm which is pivotable upon an application thereto of an adjusting value, said adjusting value being determined by said adjusting lever; a shaft supported in said housing means, said adjusting lever being connected to said shaft outside said housing means; and a pulling lever connected to said shaft and positioned within said housing means, said pulling lever transmitting an adjusting movement from said adjusting lever to said rocker lever in a force-locking fashion, wherein the adjusting movement of said pulling lever is applied to an rpm governor as a load value.

4,611,564

ELECTRONICALLY CONTROLLED FUEL INJECTION DEVICE

Takashi Miyano, Kanagawa, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,061
Claims priority, application Japan, Dec. 21, 1983, 58-242825
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 123—478 **1 Claim**

1. An electronically controlled fuel injection device of the

fuel preference type for an internal combustion engine comprising:

means for detecting accelerator pedal position;

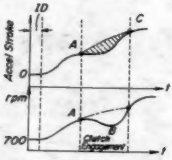
means for detecting engine speed;

a central processing unit for arithmetically operating respective detected values of the pedal position and the engine speed which are received as input;

the central processing unit comprising:

means for storing engine speed corresponding to the accelerator pedal position;

means for detecting whether the engine is in an idling state or not;



means for detecting whether the present accelerator pedal position is in any one of an acceleration state, a deceleration state or a stationary state;

means for detecting a completion of a starting state in engine operation when the engine operation is in the stationary state or in an acceleration state;

means for determining the difference between the engine speed sampled at a previous time increment and the present sampling engine speed of engine operation; and

means for deciding that an increase of load has occurred when the difference of the engine speeds is negative and for increasing the fuel amount by a fuel amount corresponding to the decreased difference of the engine speed by arithmetic operation.

4,611,565

BACKUP SYSTEM FOR ELECTRONIC FUEL INJECTION CONTROL SYSTEM

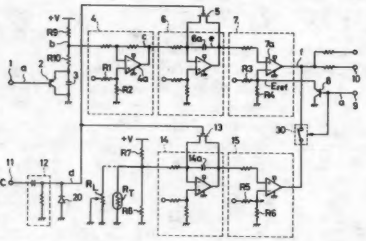
Masahiko Yakuwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,591

Claims priority, application Japan, May 25, 1984, 59-75937[U]

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—479 **10 Claims**



1. A backup system for an electronic fuel injection system operative to control the injectors of a vehicle fuel injection system to an extent sufficient to permit the starting of the internal combustion engine of the vehicle when the electronic fuel injection control system of the vehicle fails or functions abnormally, comprising

voltage signal generating means for generating a voltage signal the magnitude of which gradually varies from the time of closure of a starter switch,

an integrating circuit for receiving and accumulating said gradually varying voltage signal,

a comparator for comparing the output from said integrating circuit with a reference voltage and issuing a rectangular wave signal possessing a waveform conforming to the outcome of said comparison,

means for resetting the output of said integrating circuit to the initial value thereof in response to the occurrence of a TDC signal, and

means for feeding the output of said comparator to an injector thereby to regulate the duration of the opening of a valve of said injector.

4,611,566

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

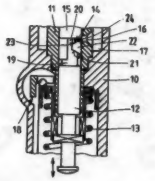
Günter Kampichler, Ruhstorf, and Karl Rapp, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 683,300

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347430

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—506 **2 Claims**



1. A fuel injection pump for internal combustion engines having a pump piston, said pump piston including an end face and a circumference, said pump piston being guided in a cylinder bushing arranged to supply fuel from a pump work chamber defined by the pump piston, said cylinder bushing comprising a fuel inflow opening therein, a control face including an oblique control edge on the circumference of said pump piston arranged to define an at least partial circumferential groove in said pump piston, the relative location of the control edge with respect to the inflow opening adapted to determine the opening and closing of the inflow opening, said at least partial circumference groove being located below said control face in a stroke direction, a longitudinal passage which extends from said end face of said piston to said at least partial circumferential groove in said piston, a leakage connection positioned between the pump work chamber and the inflow opening, said leakage connection arranged to be effective at the beginning of a pump piston supply stroke, said leakage connection having a groove means extending along a portion of the circumference of said pump piston in said control face of said pump piston parallel to and spaced apart by a short distance from an end face of said piston which defines said pump work chamber, said leakage connection including a blind bore arranged to discharge in said piston end face and a plurality of throttle bores disposed at an angular distance ($\Delta\alpha$) from one another which connect said blind bore with the bottom of said groove means, wherein said groove means includes a lower edge portion remote from said piston end face and wherein the distance from said piston end face to said lower edge portion of said groove means being dimensioned in accordance with a desired timing shift of supply onset with respect to closing of said inflow opening at low rpm, and said groove means and

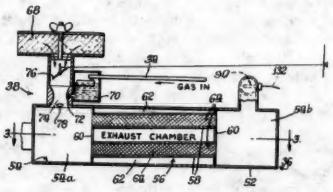
said at least one throttle bore extend in the same cross-sectional plane of said pump piston.

4,611,567

VAPORIZER/CARBURETOR

Ray M. Covey, Jr., 2901 Penwood Dr., El Paso, Tex. 79936

Filed Aug. 13, 1984, Ser. No. 640,352
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—545 **5 Claims**



1. Vaporizer/carburetor apparatus for retrofitting with a self-contained internal combustion engine utilizing petroleum fuel and for use in conjunction with such fuel in liquid form, and including a main carburetor, the engine providing vacuum in its operation, and having an exhaust pipe for exhaust gases, and further including a fuel line and means for transmitting fuel from a supply through the line to a position adjacent the engine for use therein as stated more specifically hereinbelow, said apparatus comprising,

a vaporizer unit including a casing having a fuel passage therethrough, and an exhaust passage therethrough, the passages having mutual heat exchange contact engagement,

an auxiliary carburetor having a fuel inlet operably connected with the fuel line, and a fuel mixture outlet operably connected with the inlet portion of the fuel passage, the auxiliary carburetor including means for controlling the admixture therein of fuel and air and controlling the flow of the fuel mixture into the fuel passage,

a vapor line leading from the outlet portion of the fuel passage to the main carburetor,

valve means for controlling the rate of flow of exhaust gases through the exhaust gas passage in the unit,

means for sensing the temperature of the vapor in the vapor line and correspondingly operating said valve means, and

means responsive to the vacuum produced by the engine for enabling rate of flow of the exhaust gases through said casing in direct relation to change in vacuum, whereby to increase the temperature of the fuel and increase rate of flow of vapor also in direct relation to change in vacuum.

4,611,568

INTERNAL COMBUSTION ENGINE WITH BY-PASS CONTROL SYSTEM FOR SUPERCHARGER

Hidemi Onaka; Toyokazu Baika; Yoshiaki Shibata; Kingo Horii, all of Susono, and Yasushi Sato, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 28, 1985, Ser. No. 749,795
Claims priority, application Japan, Jul. 2, 1984, 59-98468[U]
Int. Cl.[4] F02B *33/38*
U.S. Cl. 123—559 **7 Claims**

1. An internal combustion engine comprising;

an engine body;

an intake system connected to the engine body for introducing air into the engine body;

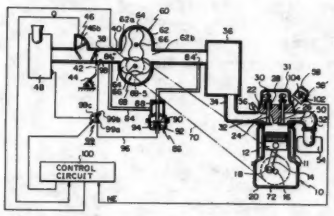
an exhaust system connected to the engine body for removal of the combustion product from the engine body;

a mechanical pump arranged as a supercharger in the intake system;

clutch means for connecting kinematically the supercharger to the engine for driving the supercharger;

actuator means responsive to at least engine load for selectively operating the clutch means;

a by-pass having a first end connected to the intake system at a position downstream of the supercharger and a second end connected to the intake system at a position upstream from the supercharger;



by-pass valve means arranged in the by-pass for controlling the flow of bypass air into the by-pass from the supercharger;

first means for producing a by-pass operating singal directed to the bypass valve means for closing the bypass when the engine load is high; and

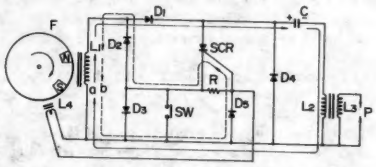
second means for producing a by-pass operating signal directed to the bypass valve means for closing the by-pass during the low load condition of the engine.

4,611,569

IGNITION SYSTEM

Tadashige Kondo, and Susumu Ohno, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,309
Claims priority, application Japan, Jun. 11, 1984, 59-85589[U]
Int. Cl.[4] F02P *3/08*
U.S. Cl. 123—600 **1 Claim**



1. An ignition system of an internal combustion engine comprising:

a permanent magnet supported by a rotary member of the engine adapted to rotate in synchronism with an rotary shaft of the engine;

a generating coil for generating an electromotive force to produce an electric current as the permanent magnet acts on the generating coil during the rotation of the rotary member;

an ignition capacitor charged by the electric current generated by the generating coil;

a thyristor caused to turn on by a counter electromotive force generated by the generating coil to thereby cause the ignition capacitor to begin to discharge; and

an ignition coil generating a high voltage as the ignition capacitor begins to discharge, to cause a spark discharge to take place in an ignition plug of the internal combustion engine;

wherein the improvement comprises:

a bypass circuit having a switch capable of being closed to

cause an electric current produced by the counter electromotive force to bypass the thyristor; and

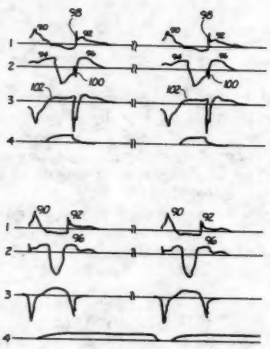
a second generating coil located anterior to the first-mentioned generating coil with respect to the direction of rotation of the rotary member for generating an electromotive force under the influences of the permanent magnet to cause the thyristor to turn on.

4,611,570

CAPACITIVE DISCHARGE MAGNETO IGNITION SYSTEM

Donald R. Nash, Berkey, Ohio, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 30, 1985, Ser. No. 728,919
Int. Cl.[4] F02P 5/145
U.S. Cl. 123—601 **34 Claims**



1. A capacitive discharge magneto ignition system comprising at least one ignition coil comprising a primary winding and a secondary winding;

a magneto comprising:

first means for generating a first induced voltage signal;

second means for generating a second induced voltage signal having a phase which varies relative to said first induced voltage in proportion to the speed of the engine; and

third means for generating a third induced voltage of polarity opposite to the polarity of said first induced voltage signal;

a circuit connecting said magneto to said ignition coil for generating a spark in response to the induced voltages and including a charge capacitor charged by said third means and

timing means responsive to the first and second induced voltage signals for advancing the timing of the discharging of said capacitor at a predetermined speed through the ignition coil to provide an ignition spark.

4,611,571

AUTOMATIC BALL THROWING MACHINE

Duane W. Tressler, 5008 Karlan Dr., Mobile, Ala. 36609, and J. C. McLeod, P.O. Box 257, Grand Bay, Ala. 36541

Filed Aug. 26, 1985, Ser. No. 769,436
Int. Cl.[4] A63B 65/12
U.S. Cl. 124—7 **1 Claim**

1. In an improved and simplified, automatic ball throwing apparatus:

a catapult beam pivotally mounted at one end on a shaft extending transversely thereto;

a follower rod fixed to and extending laterally from a side face of the beam and spaced from and parallel to said shaft;

a torsion spring helically coiled at its end sections around a respective end section of said shaft;

the spring ends being preferably fixed to respective sidewalls of the apparatus;

the spring midsection being formed as a torque exerting loop that is in a cantilevered engagement with the backside of the catapult beam;

a bumper stop operatively associated with the front side of the beam and disposed at the release or throwing position of said beam;

a frontally facing ball receiving basket disposed on the free end of the beam;

a ball feeding magazine tube having a dispensing mouth operatively associated with said basket and adapted to retain in the tube a row of said balls from which the magazine is further adapted to gravity feed but one ball to said basket per a single throwing stroke of the catapult beam;

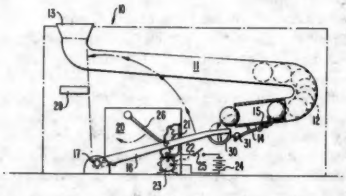
an arm pivotally mounted at an intermediate section thereof on the underside of said tube;

a first element extending from an intermediate section of the arm that is forwardly of the arm's pivot point as defined by the arm's pivotal mounting;

said first element being of a length whereby to normally extend through a first tube lower wall aperture and into a stopping position with respect to a first lead ball in the tube;

bias means normally biasing said arm to position said element in said stopping position;

a second element extending from a rear section of said arm and adapted to extend through a second tube lower wall aperture and into a stopping position, with respect to the



second lead ball of said row of balls, when the arm is pivoted from its normal biased position to withdraw the first element from its lead ball stopping position;

a lead section of said arm extending forwardly of the magazine's dispensing mouth;

a rearwardly extending lip on said basket operatively associated with said lead section of the arm;

whereby at an extreme of rearward beam travel, the basket is disposed at a ball receiving position and the lip is adapted to simultaneously bear down on the arm's lead section to thereby effect pivotal motion of the arm from its normal biased position to thereby move the second element to its ball stopping position while simultaneously carrying the first element out of its lead ball stopping position for release of said lead ball to gravity deposit in said pocket;

a single actuator rod mounted at one end for continuous rotation about its mounting and motor means to effect said continuous rotation;

said actuator rod being configured with an axially extending camming surface at its free end;

said actuator rod mounting being spaced from the beam mounting and the angular travel of said camming surface in part overlapping the angular travel of the follower rod effected by said pivotal motion of the beam;

said camming surface being operatively associated with said follower rod and adapted, upon rotation of the actuator rod, to engage and bear frontally upon the follower rod whereby to initiate said overlapping angular travel of the camming surface and the follower rod;

the actuator rod and camming surface thereof is further

adapted upon continued angular travel thereof to continually bear on the follower rod whereby to move the catapult beam from a rest position, backwards against resistance of the torsion spring to a final position of said overlapping travel whereat a maximum of energy is stored in the torsion spring and during which travel the rearwardly extending lip on the basket engages and bears against said lead section of the pivotally mounted arm to thereby effect the aforedescribed pivotal travel of the arm from said normal position for release of the lead ball;

beyond said final position of overlapping angular travel, the camming surface is adapted to lose contact with the follower rod whereby the looped torsion spring is adapted to freely release its stored energy to thereby snap the beam forwardly to pivotally hurl the beam against the bumper stop whereupon the ball carried in the basket is thrown or catapulted into space; and

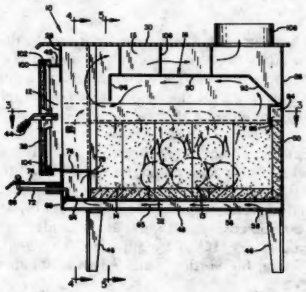
said catapult beam and pivotally mounted arm being adapted for repetitions of said described movements during rotations of said actuator rod.

4,611,572

LOW EMISSION STOVE

Donald S. Martenson, 24430 S. Highway 99E, Canby, Oreg. 97013

Filed Jul. 31, 1984, Ser. No. 636,392
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—77 **15 Claims**



1. A low emission fuel-burning stove comprising:

a firebox having bottom, side and top walls for initiating primary combustion of fuel placed at a fuel level within said firebox;

a baffle means dividing the firebox vertically into a large volume lower primary combustion chamber and a substantially smaller volume upper secondary combustion chamber, said baffle terminating in a downturned free end portion short of the front sidewall to define a pocket within an upper portion of the primary combustion chamber for trapping combustion products rising from the fuel and retaining them for further combustion within the primary chamber and heating the baffle to provide a heat source for secondary combustion in the secondary combustion chamber;

primary air inlet means in multiple sidewalls of the firebox at substantially the fuel level for injecting primary combustion air into the firebox at substantially fuel level;

second air inlet means in multiple sidewalls of said firebox substantially above the fuel level;

third air inlet means in the bottom of the firebox;

secondary combustion air inlet means above the second air inlet means at a fourth level within the firebox to supply air for secondary combustion within the secondary chamber;

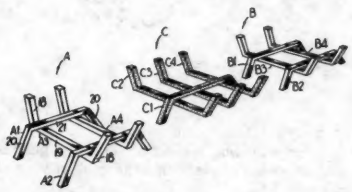
said baffle means defining with its donwturned free end portion and a sidewall a restrictive passage connecting the primary chamber to the secondary chamber for receiving combustion products discharged from the primary chamber and conveying them to the secondary chamber.

4,611,573

FIREPLACE GRATE KIT AND GRATE

Robert D. Newman, 320 Shire Way, Lawrenceville, Ga. 30245

Filed Oct. 23, 1985, Ser. No. 790,368
Int. Cl.[4] F23H *17/08*
U.S. Cl. 126—153 **13 Claims**



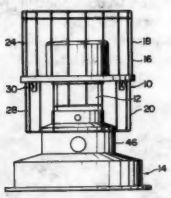
1. A freestanding fireplace grate comprising a center module interfitted between two side modules, said center module having a leg member to which at least two arm members are transversely secured, and each of said side modules having a pair of leg members to which a pair of arm members is transversely secured, whereby fireplace grates of different lengths may be constructed with the modules by forming the modules with the center module interfitted between the two side modules and with the leg members of each side modules crossing different numbers of leg members of the other modules.

4,611,574

PROTECTIVE GUARD FOR OIL BURNER

Kazuharu Nakamura, Nagoya; Yoshio Mito, Gifu, and Kazuhiko Takeuchi, Nagoya, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Jan. 23, 1985, Ser. No. 693,925
Claims priority, application Japan, Jan. 24, 1984, 59-8568[U]
Int. Cl.[4] F23C *15/36*
U.S. Cl. 126—201 **11 Claims**

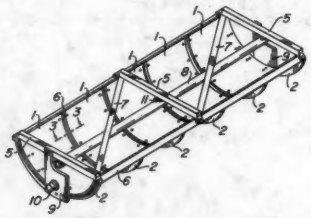


1. A protective guard for an oil burner comprising:

a guard body arranged to surround a combustion section of an oil burner, said guard body comprising an upper guard body and a lower guard body which is adapted to be fixedly mounted with respect to said oil burner, and said upper guard body being formed to be fitted on said lower guard body and closed at the upper end thereof; and

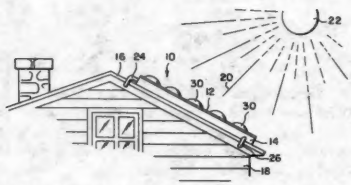
a fixing means provided between said upper guard body and said lower guard body to releasably fix said upper guard body to said lower guard body to constitute said protective guard and allow said upper guard body to be vertically moved with respect to said lower guard body in a nested manner and put on said lower guard body when said fixing means is released.

4,611,575
PARABOLIC TROUGH SOLAR REFLECTOR
Roger A. Powell, 1589 Vernon Rd., Norristown, Pa. 19401
Filed Mar. 7, 1984, Ser. No. 587,137
Int. Cl.[4] F24J *2/10*
U.S. Cl. 126—438 **8 Claims**



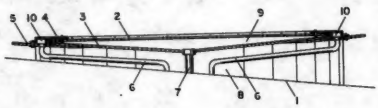
1. A trough reflector comprising:
means for providing a sheet of reflective material formed into an open concave trough shape and having a longitudinal axis,
a plurality of rib members positioned perpendicular to said longitudinal axis and attached to said sheet,
a pair of elongated longitudinal members whose axes are parallel to said longitudinal axis, said longitudinal members being attached to the ends of said rib members,
a plurality of cross members extending across the open portion of said sheet with opposite ends thereof attached to each of said longitudinal members, and forming a rectangular frame,
at least one diagonal member extending on an axis skewed to the axis of said longitudinal members with opposite ends thereof attached to said rectangular frame at opposing corners,
an elongated receiver, substantially parallel to said longitudinal axis and substantially displaced from said sheet of reflective material, said elongated receiver absorbing concentrated radiant energy reflected from said sheet of reflective material,
means for rotating said trough reflector about one axis during a day, thereby tracking the apparent motion of the sun.

4,611,576
SOLAR ENERGY COLLECTOR
Ceacer O. Stephens, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007
Continuation-in-part of Ser. No. 409,617, Aug. 19, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 659,833
Int. Cl.[4] F24J *2/08*
U.S. Cl. 126—440 **1 Claim**



1. A solar energy collector which comprises:
(a) a frame;
(b) a heat absorbing panel supported in said frame so as to be exposed to sun rays, said panel having a plurality of spaced magnifying lens integral with said panel throughout its top surface in order to concentrate said sun rays for increased efficiency and a plurality of hot water heating areas, each said area encompassed by and contiguous with each said lens, including means for detaining the water at each said lens;
(c) a water pump in fluid communication with said hot water heating areas of said panel;
(d) a hot water heating system in fluid communication with said hot water heating area of said panel; and
(e) a piping system serially connecting each said lens with said pump and water heating system, wherein said means comprises superimposed upper and lower chambers in each said area through which water circulates in succession, said upper chamber having an inlet and said lower chamber having an outlet, said chambers being separated by a transparent partition having an aperture to cause said water to flow in a zig zag path therethrough to be detained and thus absorb more heat.

4,611,577
BLACK-WATER SOLAR DISK
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806
Filed Apr. 30, 1985, Ser. No. 728,908
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—444 **1 Claim**



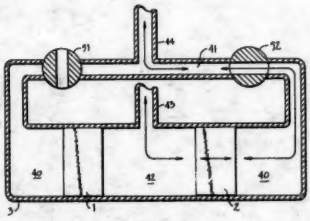
1. A black-water solar collector comprising, a flat circular plate glass window (2), a conical circular metal disk (3) having a center aperature and vertical outer edges, an annular metal plate (4), a flange plate (5), inlet tubes (6), an outlet tube (7) and a housing (8); the aforementioned parts in combination forming;
a. an expansion chamber (9) formed by said flat glass window (2) mounted above said conical disk (3), the conical surfaces of said disk inclined 5° from the horizontal, with the interior vertical dimensions of chamber (9) being 1 mm at the outside edge and 15 mm at the center,
b. a peripheral gap (11) of 1 mm formed by plate (4), flange plate (5) and the vertical outer edges of window (2) and disk (3),
c. an inlet means formed by the communication of said inlet tubes (6) with an annular inlet manifold (10) and the communication of said inlet manifold (10) with peripheral gap (11),
d. an outlet means formed by the communication of the center aperature of said conical disk with the outlet tube (7), and
e. water to which a black dye has been added to render the water opaque to the transmission of light.

4,611,578
REDUNDANT PISTON PUMP FOR THE OPERATION OF SINGLE OR MULTIPLE CHAMBERED PNEUMATIC BLOOD PUMPS
Horst P. Heimes, Aachen, Fed. Rep. of Germany, assignor to Forschungsgesellschaft fur Biomedizinischs Technik E.V. Goethestrasse, Aachen, Fed. Rep. of Germany
Filed Apr. 27, 1984, Ser. No. 604,994
Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316101
Int. Cl.[4] A61F *2/22*; F04B *35/02, 49/08*
U.S. Cl. 128—1 D **10 Claims**

1. A piston pump for operating a chambered pneumatic blood pump comprising: ends,
a hollow cylinder which is closed at both ends,
a pair of pistons slidably mounted within the cylinder, said pistons and the interior wall of said cylinder defining a first chamber between the pistons and second and third

chambers between the pistons and the ends of the cylinder,

means for driving the pistons independently of, and in opposition to each other, and comprising means for sensing and calculating the volume of blood pumped by the blood



pump during each stroke of at least one of said pistons and for controlling the driving speed of said piston to maintain a predetermined volume of blood flow, and

a first pneumatic connection between first chamber of the blood pump and one of said first, second or third chambers of the piston pump.

4,611,579

LARYNGOSCOPE

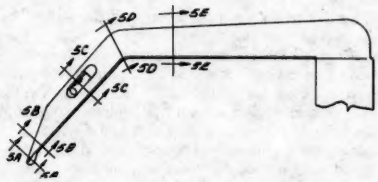
Christopher P. Bellhouse, Murwillumbah, Australia, assignor to Avulunga Pty Ltd., Murwillumbah, Australia

Continuation of Ser. No. 318,198, Nov. 4, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,760

Claims priority, application Australia, Nov. 10, 1980, PE6412; Nov. 11, 1980, PE6436

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—11 **6 Claims**



1. A laryngoscope comprising a handle and a blade, said handle having a first end and said blade having a first end attached to said first end of said handle, said blade including a pair of opposed, substantially straight component means disposed so as to form a generally V-shaped blade, a first one of said pair of component means including said first end of said blade, the second one of said pair having an end including a tip remote from said first component means and extending from the end of said second one of said component means, said pair of component means forming between them an included angle of approximately 135 degrees, the ratio of the length of one of said component means to length of the other component means being within the range of 4:5 to 4:3 so that full insertion of said tip and said second one of said component means followed by said first one of said component means into the mouth and throat of a patient will be permitted not only for the normal patient but also for a substantial number of patients having abnormalities where the user is not able to hold the tongue forward from the line of vision to allow a view of the larynx but which view is obtainable by pressing said tip posterior to the epiglottis to allow the epiglottis to be moved formwardly to facilitate a view of the larynx along said second one of said pair of component means, either by direct vision or by indirect vision through an appropriately fitted prism.

4,611,580

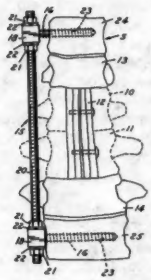
INTERVERTEBRAL BODY STABILIZATION

Kent K. Wu, Royal Oak, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Nov. 23, 1983, Ser. No. 555,363

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—69 **4 Claims**



1. The method of stabilizing the spine wherein a bone graft has been provided between oppositely spaced vertebral bodies in the space where vertebral bodies have been removed which comprises

forming spaced transversely extending parallel holes in one side of the oppositely spaced vertebral bodies,

threading a screw fixedly attached to a head, having an unthreaded opening and opposed flattened sides at the ends of said opening, into each said hole;

bringing the unthreaded openings in said heads in alignment,

passing a threaded shaft through the aligned unthreaded openings in said heads and

threading opposed nuts into engagement with opposed flattened sides of each head until the desired distance between the opposed vertebral bodies is achieved,

thereafter tightening said nuts in adjusted position engaging said opposed flattened sides to stabilize the vertebral bodies.

4,611,581

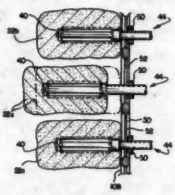
APPARATUS FOR STRAIGHTENING SPINAL COLUMNS

Arthur D. Steffee, Moreland Hills, Ohio, assignor to Acromed Corporation, Cleveland, Ohio

Filed Dec. 16, 1983, Ser. No. 562,438

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—69 **8 Claims**



1. An apparatus for maintaining vertebrae in a desired relationship, said apparatus comprising an elongated plate having one side with surface means for engaging first and second vertebrae disposed on opposite sides of a third vertebra and for bridging the space between the first and second vertebrae, first fastener means for securing said plate to the first vertebra with said surface means in abutting engagement with the first vertebra, second fastener means for securing said plate to the second

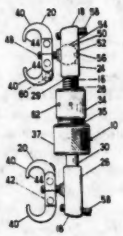
vertebra with said surface means in abutting engagement with the second vertebra, and third fastener means for securing said plate to the third vertebra with said surface means in abutting engagement with the third vertebra and with said plate spanning the space between the first and second vertebrae, said third fastener means including a force transmitting member and a nut, said force transmitting member having a first end portion which is received in an opening formed in the third vertebra to connect the force transmitting member with the third vertebra and a second end portion which extends through an opening in said plate and has an external thread, said nut being disposed in engagement with the external thread on said second end portion of said force transmitting member and with said plate, said nut being rotatable relative to said force transmitting member and said plate to press the third vertebra against said plate without rotating said force transmitting member relative to the third vertebra.

4,611,582

VERTEBRAL CLAMP

Thomas A. Duff, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 27, 1983, Ser. No. 565,283
Int. Cl.[4] A61F 5/00, 5/04
U.S. Cl. 128—69 **12 Claims**



1. A vertebral clamp adapted to control the spatial relationship between two vertebrae by attachment to the laminae thereof comprising:

(a) a longitudinally extended body having ends, the body being divided into a first half and a second half and having fastening means for adjusting the length of the body and fastening the first and second halves together; and

(b) two laminar clamps, one attached to each end of the body, each laminar clamp having means to rigidly and securely clamp to a lamina of one of the vertebrae with the other laminar clamp similarly clamped to a lamina of the other vertebra, each laminar clamp including

(i) a hook attachment member adjustably attached to an end of the body and adapted to be adjusted in its angular orientation thereto, the hook attachment member having a threaded hole extending therethrough;

(ii) at least two hooks pivotably mounted on the hook attachment member at a point of attachment thereto, each hook curving generally toward an opposing hook to form a hook floor presented toward the point of attachment such that a line drawn from a selected location on the hook floor to the point of attachment is normal to the hook floor, whereupon a vertebral lamina may be held between the opposing hooks with a reduced tendency to be released by the hooks as a consequence of pressure exerted by the lamina in a direction away from the hook attachment member; and

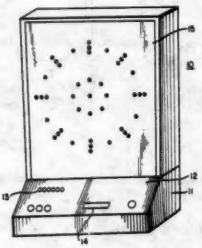
(iii) a clamping screw threadedly engaged in the threaded hole of the hook attachment member and adapted to be turned down onto and pressed against a vertebral lamina held between the hooks to securely and rigidly hold the lamina within the laminar clamp.

4,611,583

SACCADIC ENHANCER APPARATUS

Jacob Wasserman, 24 Phyllis Dr., Pomona, N.Y. 10970

Filed Feb. 19, 1985, Ser. No. 702,677
Int. Cl.[4] A61H 5/00; A61B 3/00
U.S. Cl. 128—76.5 **10 Claims**



1. A saccadic enhancer apparatus for training a user to develop accurate saccadic fixation in a plurality of directions comprising:

a display panel having positioned thereon a plurality of light emitting devices, a first grouping of said plurality of devices arranged in a first circular pattern of a given diameter, a second grouping of said plurality of devices arranged in a second circular pattern concentric with said first and of a smaller diameter, a third grouping of said plurality of devices arranged in a horizontal line pattern along the common horizontal diameter of said circles, a fourth grouping of said plurality of devices arranged in a vertical line pattern along the common vertical diameter of said circles, and at least a fifth grouping of said plurality of devices arranged along an oblique diameter of said circles;

a clock generator for generating a clock signal having a given repetition rate;

first selectable logic means including a counter responsive to said clock signal for providing a plurality of outputs in sequence each output indicative of an activation time for each of said devices in said first and second grouping of said plurality of devices to cause said devices to display said circular patterns when said first logic means is selected, said first logic means including switching means for enabling each of said devices in said first and second groupings in an alternating manner, said first logic means and said switching means cooperating when said first logic means is selected to cause each device in one of said first and second groupings of said plurality of devices to be energized in sequence and at the completion of said sequence to cause each device in another of said first and second groupings of said plurality of devices to be energized in sequence whereby when said first logic means is selected each light emitting device in one of said first and second circular patterns is sequentially illuminated and upon completion of said sequence each light emitting device in another of said first and second circular patterns is sequentially illuminated;

second selectable logic means including a shift register responsive to said clock signal and having a plurality of outputs each indicative of a selected one of said devices in said third, fourth, and fifth groupings of said plurality of devices, selection means coupled to said third, fourth and fifth groupings of said plurality of devices for selecting one grouping of those devices indicative of one of said line patterns, said shift register outputs and said selector means cooperating to sequentially energize those devices in a selected one of said third, fourth and fifth groupings in a sequence wherein the devices in a selected one of said third, fourth and fifth groupings are energized in an as-

cending order and thereafter energized in a descending order;

main selection means for selecting said first or second logic means to cause said display to provide linear or circular patterns, and

selectable timing means capable of providing a plurality of selected time intervals and coupled to said first and second logic means to cause said means to provide said associated display during a selected timing interval.

4,611,584

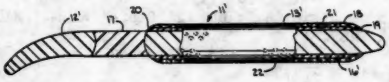
EXPANDABLE PENILE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corp., Racine, Wis.

Continuation-in-part of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and a continuation-in-part of Ser. No. 266,455, May 22, 1981, abandoned, and a continuation-in-part of Ser. No. 328,827, Dec. 9, 1981, Pat. No. 4,411,261, and a continuation-in-part of Ser. No. 478,449, Mar. 24, 1983, Pat. No. 4,532,920. This application May 2, 1984, Ser. No. 606,332

Int. Cl.[4] A61F 5/00

U.S. Cl. 128—79 5 Claims



1. A penile implant which is readily implanted and which grows in girth after implanting, said penile implant comprising:

(a) an elongated rod of physiologically inert material having a relatively short proximal stem portion adapted to be inserted into the root end of the corpus cavernosum of a penis, and a longer distal portion with a tip adapted to be implanted in the corpus cavernosum of the pendulous penis;

(b) a layer of hydrophilic material which swells as it absorbs water covering and surrounding a section of said rod; and

(c) a water permeable outer cover protecting said layer of hydrophilic material, said cover being of a material which will expand to only a limited extent when the layer of hydrophilic material absorbs water and swells.

4,611,585

MOTOR-DRIVEN CUTTER FOR THE CUTTING OPEN OF PLASTER CASTS

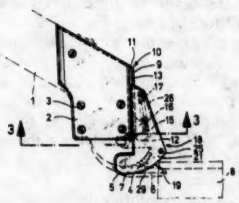
Gerhard Steidle, Bad Dürrheim, Fed. Rep. of Germany, assignor to Aesculap-Werke AG vormals Jetter & Scheerer, Tuttlingen, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 632,035

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418785

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—91 A 6 Claims



1. Motor-driven cutter for the cutting open of plaster casts with a motor housing, a fixed centre blade and two oscillatingly motor-driven blades disposed either side of the fixed blade and both interacting with said fixed blade and moving the cutter forward along the cut, comprising:

a cover hood displaceably mounted on the motor housing having glide-on surfaces disposed to contact the plaster,

flexible force storage means that acts on said cover hood to displace it into a position covering the three blades whereby the cover hood presents the glide-on surfaces which, as the cutter is pushed forward, glide on the plaster and displace the cover hood against the action of the flexible force storage means into a position exposing the blades, said cover hood consisting of two shells of mirror image construction and having two parallel side walls which extend parallel to the blades and connect to a cross-wall on their sides facing away from the motor housing, and each said shell bearing a web directed toward the other shell whereby said webs are inserted in guide grooves on the motor housing.

4,611,586

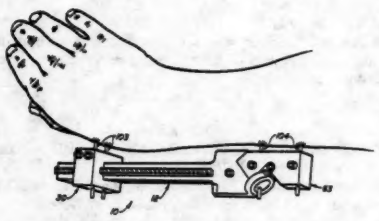
ARTICULATED COLLES' FRACTURE SPLINT

John M. Agee, 3980 Bartley Dr., Sacramento, Calif. 95822, and Francis C. King, Shingle Springs, Calif., assignors to John M. Agee, Sacramento, Calif.

Filed Oct. 6, 1983, Ser. No. 539,766

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—92 A 44 Claims



1. A fracture splint comprising: an elongated first element having block means shiftably mounted thereon near one end thereof for securing first pin means thereto, the first pin means adapted to be inserted into a bone of a patient on one side of a bone fracture; a second element pivotally mounted on said first element near the opposite end thereof for movement of the second element about an axis extending at an angle relative to and in the plane of the longitudinal axis of the first element, the second element having means thereon for securing second pin means thereto, the second pin means adapted to be inserted into the bone of the patient on the opposite side of said bone fracture, the pivotal movement of the second element relative to the first element being the only degree of freedom of the second element relative to the first element.

4,611,587

DEVICE FOR CUTTING THREADS IN THE WALLS OF THE ACETABULAR CAVITY IN HUMANS

Roy Y. Powlan, 1 Chapel Dr., Lafayette, Calif. 94549

Filed Sep. 24, 1984, Ser. No. 653,096

Int. Cl.[4] A61F 5/04

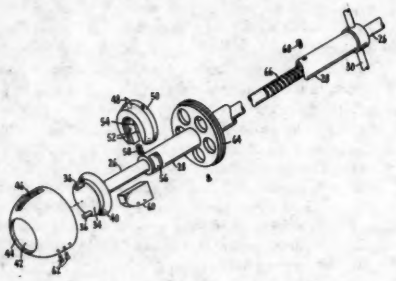
U.S. Cl. 128—92 E 7 Claims

1. A device for forming threads in the wall of the acetabular cavity, said device comprising:

(a) a cutting head shaped to closely fit within the acetabular cavity,

(b) means for positioning said cutting head relative to the cavity,

(c) a single cutting tool mounted to project exteriorly of said cutting head, and



(d) means for driving the cutting tool in a spiral path so as to cut threads in the generally hemispherical wall of the acetabular cavity.

4,611,588

LASER BEAM RESISTANT MATERIAL

Joseph E. Laptewicz, Jr., Groton, and Roland Bauer, Mystic, both of Conn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,336

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—132 R 10 Claims

8. An endotracheal tube fabricated from a composite comprising a dispersion of particulate pyrolytic graphite in an elastomer matrix.

4,611,589

DEVICE FOR REGENERATING RESPIRATORY BREATHING AIR

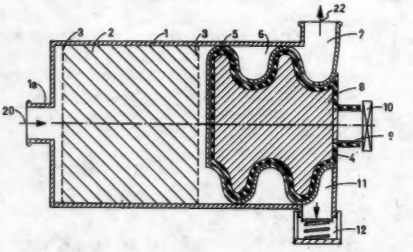
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,926

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345584

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—202.26 4 Claims



1. A device for conditioning respiratory air, comprising a container having side walls and a first end wall with a breathing gas inlet for respiratory air and an opposite end wall with an inwardly extending recess formed by a wall having course threads defining interior and exterior spiral grooves, said exterior spiral groove having an exterior surface which abuts against said side walls and which defines a spiral respiratory gas flow passage on the interior of said container between said exterior spiral grooves and said side walls, one end of said passage communicating with said container interior adjacent said inlet and an opposite end of said passage having an outlet from said container, a carbon dioxide absorbing - exothermic reacting material disposed in said container adjacent said inlet permitting flow therethrough of breathing gas from said inlet to said respiratory gas flow passage, and a coolant holder having a side wall defining course threads complimental to said interior spiral grooves which is threadably received therein.

4,611,590

ARRANGEMENT FOR ADDING LIQUID ANESTHETIC TO THE RESPIRATORY GAS SUPPLIED TO A PATIENT

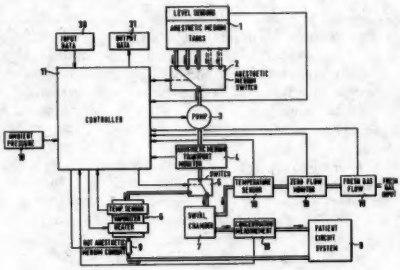
Martin Ryschka, Stockelsdorf; Wolfgang Falb, Krumesse; Peter Büttner, Stockelsdorf, and Carl-Friedrich Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,734

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401923

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—203.14 5 Claims



1. Apparatus for adding liquid anesthetic medium into the respiratory gas supplied to a patient, the arrangement comprising:

a plurality of tanks containing anesthetic mediums;

pump means for pumping the anesthetic medium of said tanks;

selective switching means for selectively switching said pump means to any one of said plurality of tanks;

vaporizer means for vaporizing the anesthetic medium and supplying the same at pure concentration for the respiratory gas to the patient;

swirl chamber means adapted for connection to a supply of fresh gas and for vaporizing the anesthetic medium into the flow of fresh gas and conducting the same for respiratory gas to the patient;

change-over switching means selectively switchable between a first position for conducting the anesthetic medium from said pump means only to said vaporizer means and a second position for conducting the anesthetic medium from said pump means only to said swirl chamber component means;

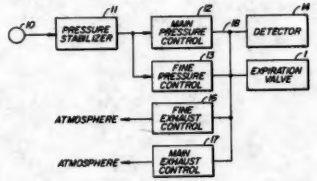
monitoring means for monitoring data from said tanks and at least one of said pump means, said selective switching means, and said vaporizer means; and,

control means for receiving and evaluating said data and for controlling at least one of said means in response to the evaluated data.

4,611,591
EXPIRATION VALVE CONTROL FOR AUTOMATIC RESPIRATOR

Koichi Inui, Higashiosaka, and Hiroshi Makita, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1985, Ser. No. 751,083
Claims priority, application Japan, Jul. 10, 1984, 59-104955[U]; Jul. 10, 1984, 59-104956[U]
Int. Cl.[4] A62B 9/02
U.S. Cl. 128—205.24 5 Claims



1. In an expiration valve control adapted to control an expiration valve installed in an expiration circuit of an automatic respirator,

a control pressure generating means for generating a control pressure for controlling the opening and closing of an expiration value, a pressure control means for controllably increasing said control pressure,

a pressure detector means for detecting said increased pressure,

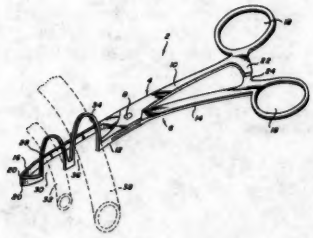
an exhaust control means for controllably releasing said increased pressure, and

a control means for controlling said pressure control means and said exhaust control means on the basis of the result detected by said pressure detector means such that said increased pressure will be maintained at a predetermined pressure level.

4,611,592
CLAMP FOR HOLDING SURGICAL LINES

Glenn E. Talboy, 1414 Warm Springs Ave., Boise, Id. 83701

Filed Aug. 5, 1983, Ser. No. 520,715
Int. Cl.[4] A61B 17/28
U.S. Cl. 128—321 4 Claims



1. A scissors-type surgical clamping device for holding surgical lines such as suction lines, electrical lines, and the like, comprising

(a) a pair of generally coplanar resilient arm members pivotally connected together intermediate their ends for relative pivotal displacement between open and closed conditions relative to each other about an axis normal to the plane defined by said arm members, said arm members including corresponding clamping and gripping portions on opposite sides of said pivot axis, respectively; and

(b) locking means for locking together said gripping portions in a resiliently deformed overcenter condition in which the clamping portions are tightly forced together;

(c) the clamping portion of one of said arm members including an offset portion that is offset in a direction normal to the plane of said arm members, said offset portion including a plurality of generally U-shaped recesses the depths of which are greater than the thickness of the clamping portion of the other arm member, the inner diameters of successive recesses increasing in the direction toward said pivot axis and corresponding with the outer diameters of the lines to be retaind therein, respectively, whereby when a surgical line is arranged in each recess and said gripping portions are locked together with a surgical curtain arranged between said clamping portions, the surgical line is retained and longitudinally displaceable within the recess adjacent the surgical curtain by said offset portion of said one arm member and by the clamping portion of said other arm member.

4,611,593
VESSEL OCCLUDING INSTRUMENT

Thomas J. Fogarty, 770 Welch Rd., Suite 216, Palo Alto, Calif. 94304; James C. Finn, III, Atherton, Calif.; Thomas B. Kinney, Mountain View, Calif., and George D. Hermann, Palo Alto, Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed Dec. 3, 1984, Ser. No. 677,561
Int. Cl.[4] A61B 17/12
U.S. Cl. 128—325 7 Claims

1. A vessel occluding instrument for facilitating the surgical treatment of an anatomical vessel, said instrument comprising

an elongated body member having top and bottom surfaces, opposed sides, and first and second opposed ends;

a length of resilient tape extending from adjacent said first opposed end of said body member;

securing means positioned adjacent said second opposed end for releasably holding said resilient tape; and

resilient pad means secured to said bottom surface of said body member,

said resilient pad means comprising a cohesive-adhesive covering sheet for releasably and atraumatically securing said pad means to said vessel, whereby said sheet and said vessel collectively produce an adherence relationship therebetween.

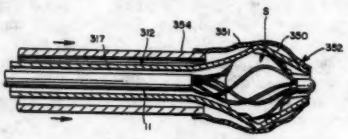
4,611,594
MEDICAL INSTRUMENT FOR CONTAINMENT AND REMOVAL OF CALCULI

John T. Grayhack, La Grange, and Theodore V. Benderev, Chicago, both of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Apr. 11, 1984, Ser. No. 599,020
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—328 8 Claims

1. An instrument for calculus containment and removal, comprising an elongated stone grasping device having a distal working end for grasping calculi; a catheter having a lumen slidably receiving said grasping device; said catheter having a body formed of flexible material and having distal and proxi-

mal end portions; said distal end portion terminating in an opening through which said work end of said grasping device may be extended and retracted for the purpose of grasping a stone and drawing it into said catheter; said distal end portion of said catheter being expandable to receive a stone retained by said working end of said grasping device and contractable to at least partially envelope said stone and working end; said distal end portion of said catheter including a plurality of elongated circumferentially-spaced flexible struts, each having proximal and distal sections, defining a basket for receiving a stone



retained by said grasping device; said distal sections of said struts converging towards each other, with said basket in substantially closed condition, when said struts are in first positions of adjustment and diverging distally outwardly to enlarge said basket and provide a distal entrance therefor when said struts are in second positions of adjustment; web means of flexible and foldable material bridging adjacent struts for substantially the full length thereof; and strut adjusting means located outside the lumen of said catheter and outside of said struts for externally engaging said struts and shifting the same between their first and second positions of adjustment.

4,611,595

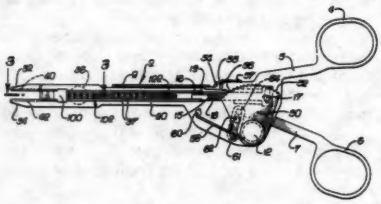
SPRING ACTIVATED HEMOSTATIC CLIP APPLICATOR

Charles H. Klieman, 3737 E. Century, Lynwood, Calif. 90262, and Richard M. Densmore, Fountain Valley, Calif., assignors to Charles H. Klieman, Lynwood and L. David Covell, Los Angeles, both of, Calif.

Continuation of Ser. No. 456,549, Jan. 10, 1983, abandoned, which is a continuation of Ser. No. 231,976, Jan. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 183,360, Sep. 2, 1980, Pat. No. 4,325,376, which is a continuation of Ser. No. 822,076, Aug. 5, 1977, abandoned. This application Jun. 18, 1984, Ser. No. 621,150

Int. Cl.[4] A61B *17/04, 17/12;* B31B *1/00*

U.S. Cl. 128—334 R **27 Claims**



1. In a surgical clip applying device of the type having a main body, a clip magazine coupled to the main body for holding a plurality of clips, clip deforming means coupled to the main body for receiving and deforming said clips, clip feed means for moving said clips from the clip magazine to the deforming means, the improvement comprising, means for actuating said clip feed means including

(i) two handle portions coupled to said main body; and

(ii) energizing means coupled to said main body, said clip feed means and one said handle portion for storing energy and selectively supplying said energy to said clip feed means, wherein movement of one said handle portion with respect to the other said handle portion causes said energizing means to store energy and subsequent movement of one said handle portion with respect to the other said handle portion causes said energizing means to supply said energy to said clip feed means so as to cause one said clip to be moved rapidly from said clip magazine to said clip deforming means.

4,611,596

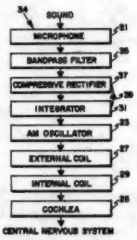
SENSORY PROSTHESES

Gerald S. Wasserman, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 14, 1980, Ser. No. 196,610

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 R **5 Claims**



1. An auditory sensory prosthesis system comprising:

transducer means for receiving acoustic stimuli and providing electrical output signals indicative thereof;

signal processing means for receiving said output signals from said transducer means, said signal processing means including dispersion means for incorporating temporal dispersion into said signals, said dispersion means including an integrator for temporally dispersing said signals received from said transducer means, said signal processing means also including rectifier means connected between said-transducer means and said dispersion means, and said signal processing means also including feedback means connected between said integrator and said rectifier means; and

signal applying means connected with said dispersion means for applying said temporally dispersed signal.

4,611,597

IMPLANTABLE DEVICE FOR THE STIMULATION OF BONE GROWTH

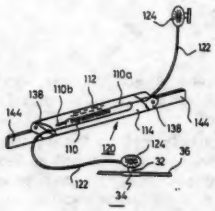
Werner Kraus, Augustenstr. 41 Rgb., Munich, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,950

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1982, 3240592

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—419 F **5 Claims**



1. An implantable device, for the stimulation of bone growth, having

a pickup coil arrangement (120) including

a pickup coil (10, 110) and at least a first and a second connection (16, 18, 110*a*, 110*b*) therefor, and an elongated cover (14, 114) having a peripheral surface and a pair of opposing end surfaces, of a tissue-compatible material, surrounding the pickup coil (10, 110); and

first and second electrical conduction means (22, 122; 24, 124) establishing first and second tissue connections;

wherein said first conduction means comprises

a tissue electrode, including an extended, strip-like, planar tissue electrode element (44, 144), coupled to and extending longitudinally along the cover (14, 114), and projecting edgewise substantially perpendicular to said peripheral surface thereof, said tissue electrode being coupled to one (18, 110*b*) of the connections (16, 18; 110*a*, 110*b*) of the pickup coil;

said second conduction means comprises at least one connector device (124) coupled to the other (16; 110*a*) of the connections (16, 18; 110*a*, 110*b*) of the pickup coil; and

a flexible insulated wire (122) is provided, interconnecting each connector device (124) and said other connection (16; 110*a*) of the pickup coil.

4,611,598

MULTI-FREQUENCY TRANSMISSION SYSTEM FOR IMPLANTED HEARING AIDS

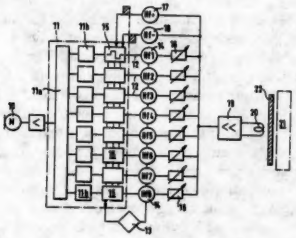
Guenter Hortmann, Neckartenzlingen, and Klaus Kunick, Stuttgart, both of Fed. Rep. of Germany, assignors to Hortmann GmbH, Neckartenzlingen, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 726,222

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420244

Int. Cl.⁴ A61N *1/36*; H04R *25/00*

U.S. Cl. 128—419 R **8 Claims**



1. A multi-frequency transmission system of an implanted hearing aid, comprising

means for converting an acoustic signal in an electric signal;

a plurality of band pass filters connected to said converting means for filtering different frequency bands in audio frequency range;

a plurality of high frequency transmitters each transmitting an amplitude modulated high frequency carrier signal;

a speech processor including a plurality of threshold switching means connected respectively between said band pass filters and inputs of said high frequency transmitters, said threshold switching means having adjustable threshold levels;

a bipolar transmitting stage including two additional high frequency transmitters connected to said speech processor to generate alternating high frequency pulses of the same length but of different polarity; said high frequency transmitters and said additional high frequency transmitters being connected via an end stage to a common transmitting coil;

a channel selector connected between said high frequency transmitters and said threshold switching means to trigger simultaneously one of said high frequency transmitters and one of said additional high frequency transmitters in said bipolar transmitting stage; and

receiving means implanted in user's body, said receiving means including a single high frequency input channel and a plurality of excitation electrodes responsive to different frequencies of the received signal.

4,611,599

ELECTRICAL APPARATUS FOR INFLUENCING THE METABOLIC CHARACTERISTICS OF LIVING SYSTEMS

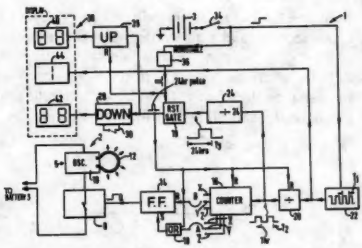
Richard H. C. Bentall, The Basement, 7 Penzance Place, London, W11 4PE, England; Timothy J. Cox, Midlothia, and Ronald D. L. Mackie, Edinburgh, both of Scotland, assignors to Richard Hugh Cameron Bentall, London, England

Filed Jun. 15, 1984, Ser. No. 621,049

Claims priority, application United Kingdom, Jun. 16, 1983, 8316377

Int. Cl.⁴ A61N *1/42*

U.S. Cl. 128—422 **12 Claims**



1. Electrical apparatus for treating a living system to influence a metabolic growth parameter of the living system, the apparatus comprising:

field applying means for applying to the system a radio frequency electromagnetic field having a predetermined characteristic and at a power level, measured adjacent a system surface, of not more than approximately 100 $\mu w/cm^2$, for influencing the metabolic growth parameter but without producing bulk heating of the system; and,

timing means for causing the field applying means to apply said field with said characteristic repetitively, for treatment periods spaced apart in time.

4,611,600

OPTICAL FIBER PRESSURE TRANSDUCER

Donald M. Cohen, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 21, 1983, Ser. No. 553,581

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—667 **2 Claims**

1. Apparatus for measuring blood pressure at a remote location, comprising:

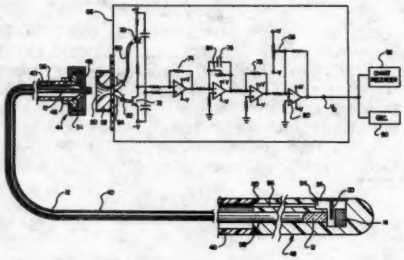
an elongated flexible tubular member;

a blood pressure transducer assembly including a transducer housing secured to the distal end of said member and being adapted to be positioned at a said remote location;

light conducting means carried within said tubular member for transmitting light to and receiving light from said transducer assembly;

said transducer housing having a cavity in light communication with said light conducting means, light reflecting means mounted in said cavity and fixed in position relative to said light conducting means for receiving light therefrom and reflecting light back thereto, shutter means located in said cavity intermediate said light conducting means and said light reflecting means and movable transversely thereof for varying the amount of light reflected

back into said light conducting means, said cavity having a side opening, a pressure sensitive membrane covering said opening and being responsive to exterior pressure applied thereto to move inwardly or outwardly of said cavity, said shutter means being carried by said membrane for blocking light in dependence upon said pressure, said



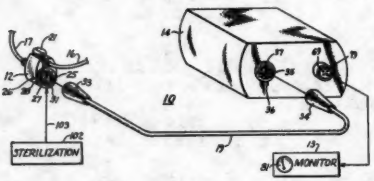
light conducting means is a single optical fiber of circular cross section, and said shutter means is rectangular and aligned with the distal end of said optical fiber and is of a uniform width transversely of the distal end less than the diameter of the optical fiber by an amount sufficient to linearly attenuate light as a function of pressure.

4,611,601

DISPOSABLE TRANSDUCER SYSTEMS

Ronald Bowman, Laguna Beach, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Feb. 17, 1984, Ser. No. 581,481
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—673 **23 Claims**



1. In a method of operating a disposable apparatus subject to resterilization inimical to said disposable apparatus, the improvement comprising in combination the steps of:

determining parameters required for operation of said apparatus;

providing a record of said determined parameters on said apparatus;

deriving said parameters by machine-reading said record in order to operate said apparatus;

said record being made destructible by resterilization; and

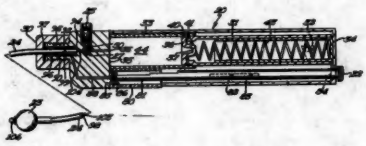
said machine-reading and the operation of said disposable apparatus being rendered impossible upon resterilization of said apparatus by destroying said record by said resterilization.

4,611,602

INSTRUMENT AND METHOD OF TUBAL INSUFFLATION

Lee R. Bolduc, Raleigh, N.C., assignor to BioNexus, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 632,417, Jul. 19, 1984. This application Jul. 5, 1985, Ser. No. 752,132
Int. Cl.[4] A61B *15/00*
U.S. Cl. 128—747 **12 Claims**



1. An instrument for determining patency of Fallopian tubes by tubal insufflation, the instrument comprising:

(a) housing means constructed and arranged to hold gas under a pressure of less than 200 MM. Hg therewithin;

(b) gas dispensing means for controllably releasing gas within said housing means to a disposable probe means, said gas dispensing means including spring means comprising a spring which urges a piston through a gas receiving cylinder within said housing means such that pressure is constantly applied to gas within said housing means; said dispensing means further including a patency indicator in operative connection to said spring means such that a change in gas volume within said housing means may be observed on the exterior of said housing means, said gas dispensing means further including valve means for charging and discharging said instrument with gas;

(c) disposable probe means constructed and arranged for dispensing gas within said instrument to a uterine cavity, said probe means adapted to be connected to said housing means so as to receive gas through said valve means, said probe means further including separate lumens through which patency measuring gas may pass from said housing means out through the probe end beyond said expandable member, said probe including a second lumen which communicates with the interior of said expandable member and with means for collapsing and expanding said expandable member and

(d) means for collapsing and expanding said expandable member, said means being constructed and arranged to include a piston and cylinder which may alternatively force air into or out of said expandable member when a probe is connected to said housing means which carries the collapsing and expanding means.

3. An apparatus for tubal insufflation of the Fallopian tubes of a female animal to determine patency comprising:

(a) housing means carrying gas dispensing control means and expansion control means;

(b) disposable probe means adapted to be connected to said housing means, said probe means carrying an expandable means at one end thereof and including first and second conduits, the second conduit being in fluid communication with said expandable means and said expansion control means, said expandable means and probe means including means positionable in the uterine cavity of a female and when expanded by said expansion control means, said expansion means being able to seal the opening to said cavity when so positioned;

(c) said gas dispensing control means and said housing means being constructed and arranged such that a quantity of gas may be held within said housing means until released to said first conduit which communicates to the end of said probe means beyond said expandable means, said gas dispensing means including spring means which when released urges said gas within said housing through said first conduit, and said dispensing means further including

a patency indicator in operative connection to said spring means such that a volumetric change of gas within said housing may be observed on the exterior of said housing means, so as to indicate the patency condition of a female and;

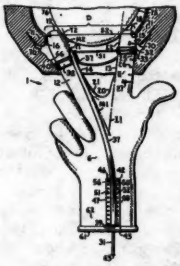
(d) gas charging means for charging gas into said housing means, said gas charging means and said gas dispensing means including means such that said gas charging means will not function when said gas dispensing means is operated so as to provide a fail-safe mechanism.

4,611,603

CALIBRATED EXAMINING GLOVE

Jimmie J. Kelso, 11812 W. 149th St., Olathe, Kans. 66062, and Russell M. Hustead, 10809 Horton, Overland Park, Kans. 66211

Filed Feb. 28, 1985, Ser. No. 706,761
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—775 **20 Claims**



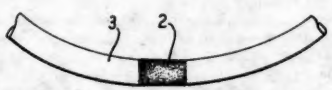
1. An examining glove, which comprises:
(a) a first finger;
(b) a second finger;
(c) a measuring string having distal and proximate ends;
(d) string attachment means fixedly attaching said string distal end to said first finger;
(e) first slip connection means connecting said measuring string to said second finger;
(f) second slip connection means connecting said measuring string to said glove in spaced relation from said fingers;
(g) said measuring string being adapted to slip with respect to said first and second slip connection means; and
(h) reference means associated with said measuring string and said second slip connection means adapted for determining measuring string travel associated with said measuring string slippage.

4,611,604

BIPOLAR ELECTRODE FOR MEDICAL APPLICATIONS

Lars Botvidsson, Jaerfaella, Sweden, and Konrad Mund, Uttenreuth, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,980
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300694
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—784 **11 Claims**



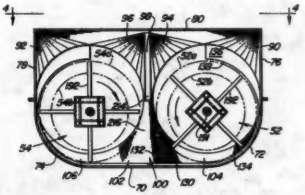
1. A bipolar electrode system for medical applications comprising an implantable heart pacemaker with an insulated flexible conductor system having at least one active electrode, a passive electrode disposed along the conductor system at an interval from the active electrode, and means for providing selected double layer capacitance at a phase boundary between a surface layer of said passive electrode and surrounding body fluids without substantial impairment of the flexibility of said conductor system, said means including a carrier material and an active region connected therewith forming said passive electrode, at least said active region of said passive electrode forming said surface layer exposed to said body fluids and providing said double layer capacitance at the phase boundary with the body fluids in the range of from about 10 millifarads per centimeter squared to about 100 millifarads per centimeter squared as measured at one hertz and said surface layer having a length along said conductor system selected for maintaining flexibility of said conductor system.

4,611,605

AXIAL FLOW ROTARY SEPARATOR

James W. Hall, Bettendorf, Iowa; Maurice A. Popelier, and Daniel L. Leemans, both of Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Aug. 29, 1984, Ser. No. 646,346
Int. Cl.[4] A01F 7/06
U.S. Cl. 130—23 **41 Claims**



1. A rotor arrangement for an axial flow rotary separator in which crop material is propelled as a mat in a generally spiral path in the annular space between a rotor and a casing surrounding the rotor and in which the rotor has an axis of rotation and a frame carrying crop engaging fingers for propelling crop material circumferentially, each finger being attached to the rotor frame at an attachment point and each attachment point, as the rotor rotates, moving only in a plane perpendicular to the rotor axis, and the casing has guide vanes for deflecting material downstrema characterized in that:

the rotor axis is offset with respect to the casing so that as the rotor rotates, the finger may intermittently engage and effectively disengage the mat and the fingers are supported so as to be axially deflectable responsive to an external applied force and so that as the rotor rotates, the fingers, when disengaged, adopt a first or disengaged position; and

so that in operation, as the rotor rotates, at least the outer portion of each finger may be deflected downstream by the mat when in engagement and when disengaged, the fingers may resume their first position.

4,611,606

FEEDING ARRANGEMENT FOR AN AXIAL FLOW ROTARY SEPARATOR

James W. Hall, Bettendorf, Iowa, and Maurice A. Popelier, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Aug. 29, 1984, Ser. No. 646,349
Int. Cl.[4] A01F 7/06
U.S. Cl. 130—23 **26 Claims**

1. A combine harvester comprising:
means for gathering crop material from a field and deliver-

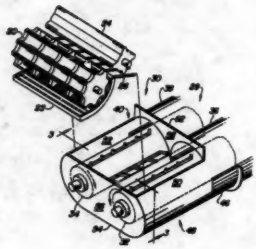
ing at least a portion of said material in a stream in a first direction; and

an axial flow rotary separator having a separator portion and an infeed portion upstream of the separator portion and including:

a pair of side-by-side generally cylindrical separator portion casings each casing having an upstream inlet and a downstream outlet;

a pair of separator rotors each having a frame, supported within a separator portion casing for rotation about an axis generally parallel to the axis of said casing, said rotors being rotatable in mutually opposite directions, each rotor having a downstream separator portion and an upstream infeed portion and being disposed so that said separator portion lies generally within the respective separator portion casing and said infeed rotor portion extends upstream of said casing;

an infeed casing portion having walls partially surrounding the rotor infeed portions and defining a conveying space between said rotor portions and said casing walls and including a pair of opposite sidewalls partially wrapping the rotor infeed portions at the opposite outer sides of the respective rotors, each sidewall terminating in an approximately axially extending edge, the respective edges being on the same side of the pair of rotors



and spaced apart so as to define approximately the lateral limits of an inlet opening, said opening being disposed in a receiving relationship with the delivered crop material stream and a generally transverse wall member extending between the sidewalls and closing the casing opposite the inlet opening; and

means effective in the conveying space for urging material spirally downstream including generally radially extending crop material engaging elements carried by the rotor, the radial extremities of said elements defining for each rotor, as the rotor rotates, an approximately cylindrical surface of revolution and said respective surfaces of revolution being

closely spaced so that when the rotors are rotated in directions such that, between the rotors, engaged crop material is propelled by said elements generally from the inlet towards the transverse wall member and at such speeds that crop material in the separator is maintained by centrifugal force in a mat generally in contact with the walls of the casing, the respective crop engaging elements of the side-by-side rotors and the transverse wall portion cooperate to divide the material stream into two portions and propel the respective portions downstream for ultimate reception by the respective inlets of the respective separator portion casings.

4,611,607

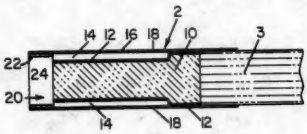
CIGARETTE FILTER

Martin L. Reynolds; Dorothy M. Frank; Tilford F. Riehl, and Andrew McMurtrie, all of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 581,516, Feb. 21, 1984, Pat. No. 4,580,584. This application Feb. 11, 1985, Ser. No. 700,584

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 **12 Claims**



1. A filter for a cigarette comprising:

a porous filter rod of cylindrical configuration;

an impervious wrapper extending longitudinally along said rod and circumscribing said rod leaving flow-through opposed ends of said rod, said wrapper having at least one longitudinally extending groove embedded into the filter rod, said at least one groove being open ended at and extending from the mouth end of the rod a distance less than the length of the filter rod;

tipping material extending longitudinally of and circumscribing said wrapper, said tipping material extending a preselected distance beyond the mouth end of the filter element thereby defining a recess at the mouth end of the filter, said tipping material including means to introduce ventilating air into said groove, said ventilating air being the only fluid flowing through said groove when the filter is used in combination with a cigarette during normal smoke draw; and,

a collar fabricated of an impermeable material disposed in said recess concentrically with the portion of the tipping material extending beyond the mouth end of filter rod, the collar being in abutment with the mouth end of the filter rod, and the thickness of the collar wall being less than the depth of the groove partially restricting the open end of the at least one groove for accelerating the velocity of the ventilation air flowing from the at least one groove.

4,611,608

PROCESS FOR UTILIZING TOBACCO DUST

Cornelis Vos, and Jan Brasser, both of Huizen, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Jan. 13, 1984, Ser. No. 570,359

Int. Cl.[4] A24B *3/14*

U.S. Cl. 131—354 **8 Claims**

1. A process for affixing tobacco dust to a comminuted tobacco-type product selected from the group consisting of tobacco, tobacco substitute and reconstituted tobacco, comprising the steps of mixing tobacco dust, a powdered water soluble hydrocolloid, and the tobacco-type product, spraying a water miscible organic solvent over this mixture, followed by an aqueous solution of a hydrocolloid and continuing the mixing until a substantially dry product is obtained, wherein:

a. the amount of tobacco-type product is at least 60% of the weight of the total mixture;

b. the amount of tobacco dust is at most 25% of the weight of the total mixture;

c. the amount of powdered water soluble hydrocolloid is at least 20% by weight of the amount of tobacco dust;

d. the amount of water miscible organic solvent is at most 10% of the weight of the total mixture;

e. the amount of aqueous solution of a hydrocolloid is from 2 to 7% of the weight of the total mixture; wherein further the water miscible organic solvent is selected from the

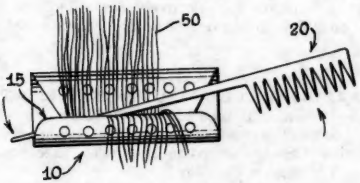
group consisting of ethanol, isopropanol, propylene glycol, glycerol, diethylene glycol, triethylene glycol and butylene glycol, and wherein the water soluble hydrocolloids are selected from the group consisting of vegetable gums, microbial gums, starch derivatives, cellulose derivatives, gelatin, casein, polyvinylalcohol and saccharose.

4,611,609

HAIR CURLER

Samuel J. Catania, 2123 Rodeo Ct., Thousand Oaks, Calif. 91362

Filed Jan. 3, 1985, Ser. No. 689,363
Int. Cl.[4] A45D *2/00*
U.S. Cl. 132—38 R 1 Claim



1. An improved hair curler construction in combination with an elongated, pointed narrow tool; wherein, the improved hair curler consists of :

an apertured generally cylindrical curler body member having an overlapping generally C-shaped cross-sectional configuration and provided with a tapered upper lip portion, and an outwardly projecting lower lip portion; wherein,

the lower lip portion has a width substantially greater than the width of the upper lip portion; the ends of the lower lip portion extend a substantial distance beyond the sides of the upper lip portion; and, wherein,

the ends of the lower lip portion form cliff surfaces, that support and guide the insertion of the said pointed narrow tool into the hollow interior of the curler body, for the purpose of forcing the users hair within the confines of said curler body member.

4,611,610

HAIR CURLING UNITS AND THEIR PRODUCTION

Nunziato Schepis, 34 Charles River Rd., Watertown, Mass. 02172

Filed Apr. 3, 1985, Ser. No. 719,514
Int. Cl.[4] A01D *4/14*
U.S. Cl. 132—39 6 Claims

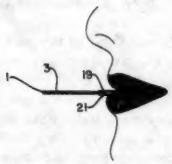
1. A hair curling unit to be formed into a roll or to be wrapped about a member, in either case then to have tresses wound about it, said unit including two interconnected, rectangular walls of flexible composite sheet material having an aluminum foil side and a paper side, the aluminum foil sides the interior surfaces of the unit, the aluminul foil side of at least one wall provided with a dehydrated exothermic coat consisting of nitric acid and mercury partly reacted therewith and bonded thereto, and said walls having at least one disconnected side margin to facilitate the admittance of coat-moistening mositure whereby the exothermic coat is activated to heat the paper sides of the unit.

4,611,611

LIPSTICK APPLICATOR AND METHOD FOR MAKING SAME

Dale C. Beal, Jr., 1112 Rear Margaret St., Key West, Fla. 33040

Filed Mar. 30, 1981, Ser. No. 249,077
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—88.7 5 Claims



1. A lipstick applicator comprising:

(a) a flat sheet of film folded over on itself to form two adjacent flaps;

(b) an upper full lip print of lipstick on the inside of one flap extending to the fold;

(c) a lower full lip print of lipstick on the inside of the other flap extending to the fold;

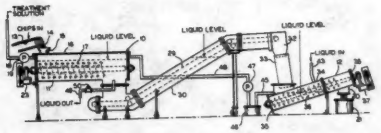
(d) the prints arranged to accurately impart a full lip print of lipstick on one's lips when the sheet is reverse-folded, placed flat between the lips, fold first, and the lips compressed thereagainst.

4,611,612

APPARATUS FOR CONTINUOUSLY TREATING SOLIDS WITH LIQUIDS

John P. Obie, Prospect Heights, Ill., and Thomas L. Faudree, Mentor, Ohio, assignors to Chicagoland Processing Corp., Elk Grove Village, Ill.

Continuation of Ser. No. 605,861, May 1, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,282
Int. Cl.[4] B08B *3/04;* B01F *7/08*
U.S. Cl. 134—65 20 Claims



1. Apparatus for continuously treating solid pieces with at least one liquid comprising:

a. first contacting means for contacting the solid pieces with a liquid including a first contacting chamber portion and a first screw conveyor portion having a shaft and a helical thread rotatably mounted within said chamber portion for conveying the solid pieces through said chamber portion;

b. driving means for rotating said first screw conveyor portion within said first contacting chamber portion;

c. means for continuously introducing the solid pieces to be treated into said first contacting chamber portion substantially at one end of said chamber portion and into said first screw conveyor portion;

d. first agitating means positioned along the peripheral margin of each section of the thread of said first screw conveyor portion for agitating the solid pieces being conveyed thereby in the area between adjacent sections of thread of said first screw conveyor portion;

e. means for continuously introducing into said first chamber portion at said one end thereof a liquid to be contained with the solid pieces being conveyed therethrough;

f. second agitating means positioned along said shaft of said first screw conveyor portion for mixing the liquid with the solid pieces being conveyed thereby within the area between adjacent sections of the thread of said first screw conveyor portion;

g. liquid discharge means in communication with said first chamber portion for continuously removing a controlled amount of liquid from said chamber portion whereby a level of liquid is maintained in the first chamber portion at least above the level of solid pieces being conveyed therethrough;

h. second contacting means for contacting the solid pieces from said first contacting means with a liquid including a second, substantially inclined contacting chamber portion and a second screw conveyor portion having a helical thread rotatably mounted within said second contacting chamber portion for conveying the solid pieces through said second chamber portion from a first lower end portion of said chamber to a second higher end portion of said chamber;

i. driving means for rotating said second screw conveyor portion within said second contacting chamber portion;

j. means for continuously introducing a liquid into said second chamber portion to be contacted with the solid pieces being conveyed therethrough;

k. third agitating means positioned along the peripheral margin of each section of the thread of said second screw conveyor portion for agitating the solid pieces being conveyed through said second chamber portion in the area between adjacent sections of the thread of said second screw conveyor portion;

l. liquid passage means associated with the peripheral margin of each section of the thread of said second screw conveyor portion for allowing liquid to pass through said sections; and

m. discharge means for removing solid pieces from said second contacting means.

4,611,613

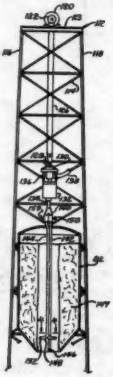
DECOKING APPARATUS

Richard D. Kaplan, Flossmoor, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 29, 1985, Ser. No. 695,904

Int. Cl.[4] B08B *3/02, 9/02*

U.S. Cl. 134—95 **7 Claims**



1. A decoking apparatus, comprising:

a substantially vertical nozzle for fluidly cutting a pilot hole through a bed of coke;

radial nozzles positioned generally above and transverse to said vertical nozzle for fluidly cutting and removing substantially all of the remaining bed of coke after the pilot hole has been cut;

first elongated substantially vertical conduit means connected to said vertical nozzle for feeding a cutting fluid to said vertical nozzle;

second elongated substantially vertical conduit means having a length shorter than said first conduit means for positioning said radial nozzles generally above said vertical nozzle, said second conduit means being positioned substantially parallel, external, and adjacent to said first conduit means and connected to said radial nozzles for feeding a cutting fluid to said radial nozzles; and

valve means operatively connected to said first and second conduit means for selectively controlling the flow of cutting fluid to said vertical nozzle and said radial nozzles.

4,611,614

APPARATUS FOR CLEANING PARTS OF PROCESSING MACHINES FROM RESIDUES

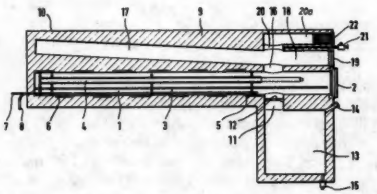
Rudolf Schmidt, Munich, Fed. Rep. of Germany, assignor to Caroline Christ, Fabrikation chemischer Erzeugnisse, Dachau, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,732

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309878

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—107 **16 Claims**



1. An apparatus for cleaning parts of a processing machine from residues, especially from synthetic residues; comprising:

a housing accommodating a closable inner container for receiving the parts to be cleaned;

a tank connected to the housing at an angle thereto and containing a liquid heatable heat carrier medium;

connecting means for allowing a communication between the tank and the container; and

moving means for automatically tilting the housing between a first position in which the container is in an essentially horizontal position and being chargeable with the parts while the heat carrier medium is still within the tank and a second position in which the container extends in an essentially vertical position for allowing the heat carrier medium to automatically flow from the tank into the container to sufficiently fill the latter wherein upon return of the housing from the second position to the first position, the heat carrier medium automatically returns from the container into the tank thereby allowing discharge of the cleaned parts wherein the heat carrier medium flows from the tank into the container up to a maximum filling level upon movement of the housing into the second position, the connection means being arranged above the maximum filling level wherein the housing further accommodates overflow means associated to the container and arranged at the level of the maximum filling level of the heat carrier medium in the container, the housing still further accommodating an overflow reservoir arranged above the container when the housing is in its first position and extending inclined with respect to the container, the

overflow means providing a communication between the overflow reservoir and allowing the heat carrier medium to flow from the overflow reservoir directly into the tank when the housing is moved from the first position into the second position.

4,611,615

FLUID TREATMENT APPARATUS AND METHOD

Ljubisa M. Petrovic, 15918 Mission Village Dr., Houston, Tex. 77083

Filed Nov. 2, 1983, Ser. No. 547,833
Int. Cl.[4] B01D *35/06*; F02M *27/00*
U.S. Cl. 137—13 **22 Claims**

1. A method for preventing and reducing the problems associated with emulsion and build-up of paraffin, scale, salt encrustation and the like on the surface of a structure transferring a fluid comprising:

(a) inducing turbulent flow of the fluid within the structure;

(b) subjecting the turbulently flowing fluid to a sequence of magnetic fields of alternating polarity by passing the turbulently flowing fluid in the vicinity of a plurality of discrete solid cylindrical magnets aligned linearly along the direction of fluid flow with like poles of adjacent magnets oriented adjacent to one another;

(c) inserting a solid disk-like ferromagnetic element between the like poles of adjacent magnets to intensify the magnetic fields;

(d) positioning a ferromagnetic member at each extremity of the linearly aligned magnets to close and intensify the magnetic fields at the extremities;

(e) inducing further turbulent flow of the fluid as it flows in the vicinity of the magnets.

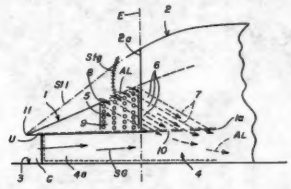
4,611,616

AXIALLY SEMISYMMETRICAL SUPERSONIC AIR INTAKE FOR REACTION ENGINES, PARTICULARLY SOLID FUEL RAM JET ROCKET ENGINES

Wulf-Dieter Pohl, Zorneding, and Ernst-Otto Krohn, Lohmar, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,605
Int. Cl.[4] F02C *7/04*
U.S. Cl. 137—15.1 **2 Claims**

1. An axially extending supersonic air intake for reaction engines having an air intake cowl and a front opening in an intake plane, comprising a semiconical displacer body extending out of the opening beyond the intake plane terminating substantially at a point diverging from the front point toward said plane and having a flat bottom in a conical body diverging toward the plane and including a cover sheet portion having a plurality of bleed openings into said body disposed in the area of external normal shock produced during the subcritical conditions and which oscillates backwardly and forwardly, a boundary layer plow extending below said bottom, a plurality of spaced apart baffles extending from said openings through



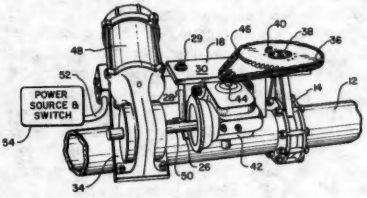
said flat bottom within said displacer body, said baffles defining channels leading from the openings into said plow, said baffles being semiconical and being arranged coaxial with said displacer body and taper in a direction opposite to the taper of said displacer body.

4,611,617

IRRIGATION VALVE CONTROL APPARATUS

Ronnie D. Hewitt, Rte. 1, Box 48, Oakley, Id. 83346

Filed May 23, 1985, Ser. No. 737,332
Int. Cl.[4] F16K *17/40*, *31/05*
U.S. Cl. 137—68.1 **16 Claims**



16. An irrigation valve control apparatus comprising:

a mounting bracket having a curved brace secured to the mounting bracket and configured so as to be capable of supporting the mounting bracket on an irrigation pipe, the mounting bracket being capable of being secured to an irrigation valve mechanism by a plurality of bolts and being capable of receiving for attachment a motor and a gear box;

an electrical motor having a power rating of approximately one horsepower mounted to the mounting bracket;

a gear box having a gear ratio of at least 30:1 and a drive shaft extending generally vertically from the gear box, the gear box being mounted to the mounting bracket;

means for placing the motor in mechanical communication with the gear box comprising a drive shaft extending generally horizontally from the motor and being securely attached to the gear box;

a main gear mounted on the valve mechanism;

means for placing the main gear in mechanical communication with the gear box comprising a drive chain secured to the main gear and to the drive shaft extending generally vertically from the gear box;

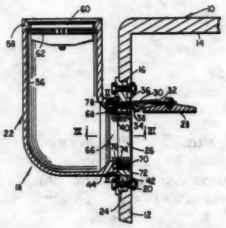
means for controlling the operation of the motor comprising an electrical cable attached to the motor and extending to an electrical power source remote from the apparatus and a switch on the cable disposed between the motor and the electrical power source; and

safety shut-off means comprising a shear pin such that when the apparatus is subjected to forces, while in operation, which could otherwise damage the apparatus, the shear pin will shear away causing the motor to shut off.

4,611,618
FRANGIBLE FITTINGS

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 19, 1984, Ser. No. 591,257
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—68.1 12 Claims

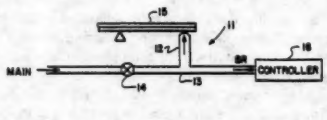


1. A frangible fluid fitting comprising first and second fluid conducting parts each having coaxial passages and interconnected about the passages' axis at a parting line by frangible connector means, a valve mounted upon at least one of said parts positionable between passage open and closed positions, and a detent mounted upon said one part operatively connected to said valve positionable between a valve retaining position maintaining said valve in its open position and a valve release position permitting said valve to move to its closed position, the improvement comprising, an annular recess defined in one of the parts at the parting line circumscribing the passages' axis, a plurality of balls filling said recess and maintained therein by the other part, the detent operatively engaging said balls whereby engagement of said balls by the detent maintains the detent within its valve retaining position and fracture of the frangible connector means to permit relative movement between the fitting parts at the parting line permits movement of said balls within said recess to release the detent to its valve release position.

4,611,619
AIR CONSERVING RESTRICTION FOR USE IN PNEUMATIC SYSTEMS

Peter P. Payne, Wheeling, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 620,366, Jun. 13, 1984, abandoned. This application Jul. 17, 1985, Ser. No. 755,878
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—82 25 Claims

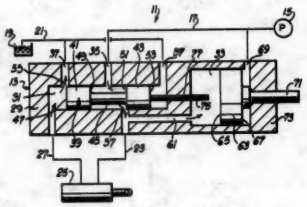


1. A pneumatic condition sensing system for reducing the consumption of air supplied by a pneumatic source comprising:
- a bleed type condition sensor for bleeding air from a branch line to atmosphere to control the pressure within the branch line in response to a sensed condition;
- an elongated restriction for connecting said bleed type condition sensor to said pneumatic source, said elongated restriction having an air conserving flow versus pressure relationship, said relationship being anywhere within a range from concave to linear; and,
- a controlled connected to said branch line and responsive to the pressure therein for providing a control function usable in controlling the condition.

4,611,620
HYDRAULIC CIRCUIT BREAKER

Hsien B. Wang, Newport Beach, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 2, 1981, Ser. No. 250,398
Int. Cl.[4] F15B *11/08*
U.S. Cl. 137—100 13 Claims



1. A hydraulic circuit breaker for use with a hydraulic device comprising:
- means defining a supply conduit for supplying hydraulic fluid under pressure to the hydraulic device;
- means defining a return conduit for carrying hydraulic fluid away from the hydraulic device;
- means defining a supply orifice in said supply conduit through which the fluid can flow, the flow of fluid through said supply orifice causing a first pressure drop;
- means defining a return orifice in said return conduit through which the fluid can flow, the flow of fluid through said return orifice causing a second pressure drop;
- means responsive to at least one of said pressure drops for varying the areas of said orifices to maintain said pressure drops substantially constant over a range of flow rates during normal operation; and
- means responsive to at least said first pressure drop reaching about a predetermined value for substantially closing said supply orifice to terminate flow through the supply orifice to the hydraulic device.

4,611,621
PRESSURE CONTROL VALVE AND OIL SUPPLY DEVICE USING SAID VALVE

Shinpei Miyakawa, and Masaaki Kinbara, both of Tokyo, Japan, assignors to Ebara Corporation, Japan

Continuation-in-part of Ser. No. 537,363, Sep. 15, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,112
Claims priority, application Japan, Jan. 16, 1982, 57-5251; Jan. 16, 1982, 57-5252; PCT Int'l Appl., Jan. 17, 1983, PCT/JP83/00014
Int. Cl.[4] F16K *17/00*
U.S. Cl. 137—115 11 Claims

1. A pressure control valve, comprising:
- a guide valve including a first spool whose movement is restricted by the pressure of a spring and a pilot pressure opposing each other;
- a cylinder incorporating therein a slidable piston into which an operating fluid flows in response to the movement of said first spool of said guide valve; and
- a throttle valve including a second spool whose movement is controlled by said piston slidably disposed inside said cylinder;
- said guide valve including a valve body equipped with a barrel bore and said first spool slidably disposed inside said barrel bore, a pressurized oil inlet port into which pressurized oil from a hydraulic source flows, a port for

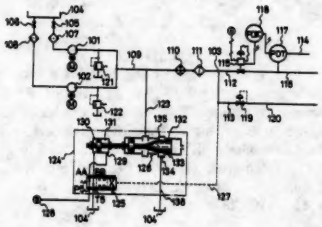
relieving the pressurized oil, a pilot port into which a pilot pressure oil is applied, and a pair of change-over ports which are changed over by the movement of said first spool and are disposed in said valve body so as to communicate with said barrel bore;

urging means for urging said first spool unidirectionally, being operatively connected to one end of said first spool with the other end of said spool being opposite to said pilot port;

said first spool being provided with control means for controlling the passage of the pressurized oil from said hydraulic source;

said throttle valve including a valve body equipped with a barrel bore, said second spool slidably disposed inside said barrel bore, a pressurized oil inlet port into which pressurized oil to be controlled flows, and a port for relieving the pressurized oil, being disposed on said valve body of said throttle valve so as to communicate with said barrel bore of said throttle valve;

said second spool being connected to said piston and provided with means for throttling the flow rate of the pressurized oil to be controlled;



said cylinder being separated by said piston into a first cylinder chamber and a second cylinder chamber;

said first cylinder chamber communicating with one of said pair of change-over ports via an oil passage, and said second cylinder chamber communicating with the other change-over port of said change-over ports via an oil passage;

said pressurized oil inlet port and said pressurized oil relief port communicating with said barrel bore via respective ports defined as circumferential grooves around the inner circumference of said barrel bore;

said means for throttling the flow rate of the pressurized oil to be controlled including

a land provided on said second spool and lapping over said one of said ports defined as circumferential grooves which communicates with said relief port for the pressurized oil; and

said second spool situated to be movable only by the pressurized oil introduced into the cylinder chambers on both sides of said piston.

4,611,622

DRAIN FOR CONDENSATE FROM FLUE GAS

Hongsik Ahn, Chesterfield, Mo., assignor to Intertherm Inc., St. Louis, Mo.

Filed Nov. 13, 1984, Ser. No. 670,261
Int. Cl.[4] B08B 3/00
U.S. Cl. 137—145 **3 Claims**

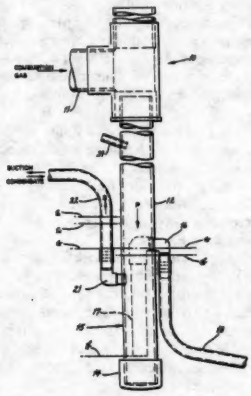
1. For maintaining a desired sub-atmospheric pressure in a flue gas at a selected point in a system burning hydrocarbon fuel from which water vapor condenses, a trap and drain comprising

a standpipe in communication with and below a flue,

means to establish an overflow level of said standpipe and to drain condensate therefrom,

a dip tube connected to said overflow outlet means and extending downward within said standpipe to a trap level above the base of the standpipe, and

downward-leading means, entering said standpipe at a level between the trap level and the overflow level, to conduct to the standpipe condensate from such selected point in



the system at which such sub-atmospheric pressure is to be maintained,

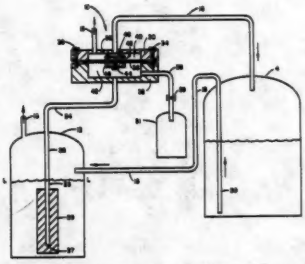
whereby after the standpipe is filled with water to such overflow level, such negative pressure is maintained by the rise of water from said standpipe into said downward-leading means.

4,611,623

LIQUID LEVEL INDICATOR AND VALVE

Roy G. Goodrich, Baton Rouge, La., assignor to Louisiana State University and Mechanical College, Baton Rouge, La.

Filed Jun. 27, 1985, Ser. No. 749,432
Int. Cl.[4] F17C 7/02
U.S. Cl. 137—210 **21 Claims**



1. A device for monitoring, in a first vessel, the liquid level of a liquid having a temperature less than the ambient atmospheric temperature and for effecting the transfer of liquid to said first vessel from a second vessel upon the liquid level in said first vessel reaching a predetermined minimum point, said device comprising:

a. a pressure sensitive means in contact with a gas in a first chamber and a gas in a second chamber, said pressure sensitive means being movable between a first position and a second position, said second position being towards said first chamber when the gaseous pressure in said first cham-

ber is lower than the gaseous pressure existing in said second chamber;

b. a vent for placing said first chamber in gas communication with the ambient atmosphere;

c. a conduit in gas communication with said first chamber and with the interior of said second vessel whereby said first chamber and said second vessel are in gaseous communication with one another;

d. valve means associated with said pressure sensitive means to alternately seal off and leave open said gas communication between said first chamber and said second vessel upon the movement of said pressure sensitive means, respectively, to said second position and to said first position;

e. an elongated hollow stem which, at one of its ends, is in gas communication with said second chamber and which, at its other end, is sealed off, said hollow stem having,

(i) said other end and a contiguous portion of said hollow stem located within said first vessel whereby said other end extends to a point adjacent said predetermined minimum liquid level, and

(ii) a portion which is exterior of said first vessel and in contact with said ambient atmosphere,

f. insulation means for insulating said other end of said stem and a certain part of said contiguous portion, the upper extent of said insulating being below a desired maximum liquid level in said first vessel, and the lower extent of said insulation being adjacent said predetermined minmum liquid level; and

g. a fluid within said hollow stem, said fluid providing,

(i) a first pressure in said second chamber to allow said pressure sensitive means to move to said first position when said liquid level in said first vessel is at or just adjacent said maximum liquid level, and

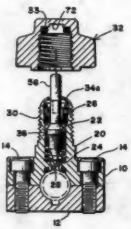
(ii) a second pressure in said second chamber to allow said pressure sensitive means to move to said second position when said liquid level in said first vessel is at or below said minimum predetermined liquid level.

4,611,624

LINE PIERCING VALVE ASSEMBLY

Benjamin L. Snyder, N. Miami Beach, Fla., assignor to Watsco, Inc., Hialeah, Fla.

Filed Sep. 12, 1985, Ser. No. 775,342
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—318 **1 Claim**



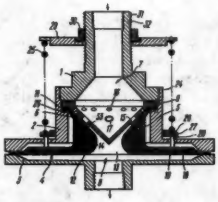
1. In a line piercing valve assembly of the type having upper and lower housing portions removeably secured to one another to define therebetween a transverse cylindrical bore for the reception of a length of tubing to be pierced, wherein the upper housing portion is integrally formed with a cylindrical projection defining a concentric interior recess having a longitudinally symmetrical piercing needle and valve member disposed therewithin for coaxial movement therealong depressable into said bore, and further including spring means urging the piercing needle and valve member away from the bore into sealing contact with an annular valve seat secured within the interior recess near the outer end thereof, and further including a sealing cap threadedly engageable over the outer end of the cylindrical projection in closing relation with respect to the interior recess thereof, and further including removeable means cooperative with the sealing cap for depressing the piercing needle and valve member axially toward the transverse bore to pierce a length of tubing received in the transverse bore upon threaded advancement of the sealing cap; the improvement comprising, a depressor pin, means for removeably securing said depressor pin in coaxial relation upon the outer end of the piercing needle and valve member, the sealing cap having an interior wall portion abuttingly engageable with the outer end of said depressor pin for depressing said piercing needle and valve member upon the threaded advancement of the sealing cap, said means for removeably securing said depressor pin in coaxial relation upon the outer end of the piercing needle and valve member comprising a coaxial, internally-threaded, cylindrical recess in said outer end of said piercing needle and valve member, said depressor pin having an externally-threaded lower end portion threadedly engageable within said internally-threaded recess, and an internally-threaded annular stop ring threadedly receivable about the outer end of the cylindrical projection, said stop ring serving to limit downward movement of the piercing needle and valve assembly upon the screw-threading in place of a charging hose fitting or the like.

4,611,625

LIQUID PRESSURE REGULATOR

Vitaly F. Bugaenko; Nikolai F. Linsky; Raisa I. Bychkova, all of Dnepropetrovsk; Boris V. Karmugin, and Vladimir A. Akopiants, both of Kiev, all of U.S.S.R., assignors to Proizvodstvennoe Obiedinenie "Kievpromarmatura" , Kiev, U.S.S.R.

Filed Nov. 21, 1985, Ser. No. 800,459
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—505.25 **3 Claims**



1. A liquid pressure regulator comprising:

a housing having inlet and outlet chambers;

a pressure-sensitive element disposed in said outlet chamber of said housing;

a seat in the form of a hollow cone having a base, an interior, and a tapered surface, and being secured in said housing so that said base is disposed in said inlet chamber of said housing with which said interior of said seat communicates;

said tapered surface of said seat having perforations by means of which said inlet chamber communicates with said outlet chamber of said housing;

a member for controlling the flow of liquid cooperating with said seat and forming a gate therewith; said flow controlling member being fabricated from an elastic material and having the form of a single elastic element including a first portion in the form of a first membrane, a second portion in the form of a second membrane, and a third portion connecting said first portion with said second portion into an integral unit;

said first membrane being secured in said outlet chamber of said housing;

said second membrane being secured in said housing at said base of said seat;

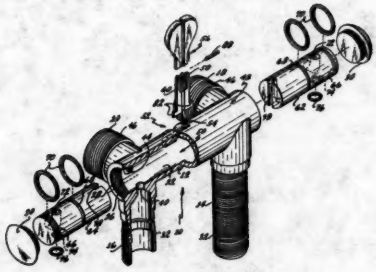
said third portion having a central hole partially conical in the zone of said gate to mate with the tapered surface of said seat.

4,611,626

FLUID CONTROL VALVE

Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631

Filed Sep. 11, 1984, Ser. No. 649,831
Int. Cl.[4] F16K *11/20*
U.S. Cl. 137—594 1 Claim



1. A valve for use in either separately or concurrently controlling hot and cold water flow to a washing machine which comprises:

a unitary valve body shaped so as to include an internal, elongated, cylindrical hollow valve bore having internally threaded ends open to the exterior of said valve body,

said valve body also including a first inlet nipple and a first outlet located at an angle of 90° with respect to one another around the axis of said bore adjacent to a first one of said ends of said bore and also including a second inlet nipple and a second outlet located at an angle of 90° with respect to one another aound the axis of said bore adjacent to the other of said ends of said bore, both of said inlets and both of said outlets having internal orifices intersecting said bore,

said valve body also including an opening leading into said bore and located medially of the ends of said valve and extending across 90° around the axis of said bore,

a cylindrical valve element located at each of said ends of said bore,

each of said valve elements fitting closely within said bore so as to be capable of being rotated therein and having a right angle passageway which is capable of being positioned so as to place one of said inlet nipples in communication with its associated outlet and which is capable of being located so as to block flow between such inlet and said outlet,

each of said valve elements also including a depression capable of being positioned so as to extend around the inlet orifice adjacent to such valve element and circumferential grooves located at each side of such depression,

a sealing member located within the depression of each of said valve elements and within each of said circumferential grooves, said sealing members extending from said valve elements so as to form a seal with the interior of said bore,

said valve elements also having adjacent ends with dog-legged shaped slots located therein, said adjacent ends of said valve elements being located adjacent to said opening in said valve body,

a split handle extending from the exterior of said body into the interior of said body through said opening,

said split handle having first and second separate sides, a portion of each of said sides being shaped so as to fit within the slot in one of said valve elements in such a manner so that said sides cannot be withdrawn from such member when the valve is assembled, said sides of said split handle being separately movable with respect to one another and being located closely enough adjacent one another so as to be capble of being moved as a unit, and

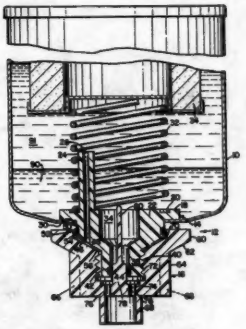
end caps threaded within each of said ends of said bore, said end caps serving to maintain said valve elements within said bore with the adjacent ends of said valve elements closely enough adjacent to one another so as to retain said sides of said split handle in said slots.

4,611,627

SELF-VENTING DRAIN VALVE

Frank H. Eidsvoog, Brooklyn Center, and Sean T. Warren, Savage, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 7, 1985, Ser. No. 699,021
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—588 7 Claims



1. A self-venting valve for use in controlled draining of liquids in a closed container comprising:

a first member affixed to said container and a second member formed to threadably engage said first member, said first member including primary and secondary passages extending therethrough, said secondary passage extending through said first member,

said second member including a third passage therethrough,

means on said first member for conducting fluids from said secondary passage through said third passage,

said first and second member together forming first, second and third seals therebetween,

said first member having a cylindrical upper portion, a tapered portion extending downwardly therefrom, and a threaded cylindrical portion extending downwardly from said tapered portion,

said second member having a cylindrical upper portion, a tapered portion extending downwardly therefrom, and a threaded cylindrical portion extending downwardly from said tapered portion and sized to engage said threaded portion on said first member,

a first seal between said first and second members for restricting the passage of fluids from said first to said third passage, said seal being releasable by partially unscrewing said second member from said first member,

a second seal located between said first and second members along said tapered portions, said second seal being configured so that unscrewing of said first and second members will break said second seal before said first seal,

a third seal located between said first and second member along said cylindrical portions, said third seal being configured so that unscrewing of said first and second members will break said third seal before said first seal,

said secondary passage terminating at its lower end on said first member between said second and third seals on said tapered portion,

and fourth passage means extending through at least one of said threaded portions and ending adjacent said third passage so that when said second and third seals are broken, a path of fluid communication will exist between the interior of the container and said third passage, allowing equalizing of pressures inside and out of the container.

4,611,628

ATTENUATOR VALVE FOR A PRESSURE-GAS CONDUIT

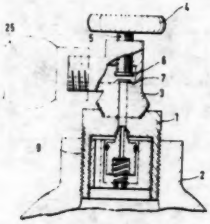
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,292

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424503

Int. Cl.[4] F16K *17/30*

U.S. Cl. 137—509 5 Claims



1. An attenuator valve insertable into a pressure-gas conduit for attenuating the impact pressure of the pressurized gas downstream of the source of the pressurized gas, the attenuator valve being insertable between a sealing valve and said source, the attenuator valve comprising:

a housing defining a recess having a bottom facing toward said source and an outer end facing away from said source;

mounting means for mounting said housing in the conduit;

a structure having a cavity formed therein and being mounted in said recess with said cavity facing the bottom of said recess;

a valve body movably mounted in said cavity so as to cause one end of said valve body and said structure to conjointly define an enclosed chamber in at least part of said cavity;

first passage means formed in said housing and extending from said recess to said outer end of said housing;

valve seat means formed in said recess so as to extend into said first passage means;

valve closure means formed on the other end of said valve body and adapted for contact engaging said valve seat means to close off said first passage means with respect to said recess;

resilient means acting on said valve body for resiliently holding said valve closure means in contact engagement with said valve seat means;

second passage means for connecting said first passage means with said chamber;

throttle means connecting said chamber with said source for allowing an immediate initial limited flow of the gas to pass into said chamber from said source when the sealing valve is opened thereby causing the pressure in said chamber to drop to a level less than the pressure of said source as said limited flow passes on through said second passage means and then through said first passage means with attenuated impact pressure downstream of the sealing valve; and,

third passage means connecting said other end of said valve body to said source for permitting gas at the pressure of said source to displace said valve body against the force of said resilient means after the pressure in said chamber has fallen thereby moving said valve closure means away from said valve seat means after said initial limited flow and increasing the flow of the gas passing through said first passage means without impact pressure downstream thereof.

4,611,629

THERMOSTATICALLY ACTUATED VALVE

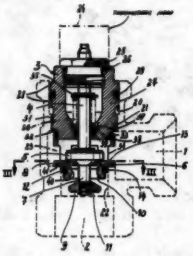
Günther Seiffert, Olsberg, Fed. Rep. of Germany, assignor to F.W. Oventrop Arn. Aohn KG, Olsberg, Fed. Rep. of Germany

Filed Jul. 16, 1985, Ser. No. 755,484

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440198

Int. Cl.[4] F16K *31/18*

U.S. Cl. 137—614.21 8 Claims



1. A thermostatic valve comprising:

a valve housing formed with a bore, an inlet fitting communicating with said bore and outlet fitting communicating with said bore; and

a valve insert threadedly received in said bore, said insert being a unit receivable in said housing and removable as a unit therefrom and comprising:

an insert body sealed with respect to said bore,

a valve stem extending axially through said body and provided with a main valve member engageable with a main valve seat in said body communicating between said fittings via a valve passage surrounded by said main valve unit,

a neck passing through said passage with clearance,

a limiting body on said neck engageable with an auxiliary valve seat formed at an opposite end of said passage from said main valve seat, said limiting body being of a greater cross section than said passage, and

a spring in said body bearing upon said stem and urging said limiting body into engagement with said auxiliary seat in a maximum open position of said main valve member with respect to said main valve seat, said seats and said passage being formed in a sleeve affixed to an upper portion of said insert body, said sleeve being provided with a flange unidirectionally engaging an abutment formed in said housing immediately adjacent a portion of said bore upon threaded insertion of said insert in said housing, a sealing ring being provided between said sleeve and said portion of said bore immediately adjacent said flange.

4,611,630

SINGLE HYDRAULIC LINE CHOKE VALVE SYSTEM

John D. Muchow, Sugar Land, and Kenneth L. Pelata, Pearland, both of Tex., assignors to Hydril Company, Houston, Tex.

Filed Dec. 6, 1984, Ser. No. 678,657

Int. Cl.[4] F16K *3/24, 31/163, 31/528*

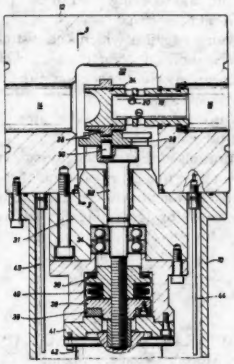
U.S. Cl. 137—625.37 6 Claims

1. Apparatus for determining fluid flow rate, comprising a choke valve, including

a cylinder with an axial exit opening and a plurality of entrance side flow ports,

a sleeve moving concentrically over said cylinder to determine the amount of entrance opening provided by said side flow ports, said sleeve including side keying means,

a back-and-forth carrier operating with said sleeve side keying means for causing said sleeve to progress from opening to closing and back to opening of said side flow ports with the travel of said carrier, said carrier including eccentric drive keying means,



said carrier including a recess for accommodating said sleeve side keying means,

said sleeve side keying means being a projection for riding in said recess in said carrier,

a rotatable drive shaft at right angles to said cylinder and sleeve including compatible means for operating with said carrier drive keying means, and

power means connected for rotating said rotatable valve drive shaft including a dynamic fluid actuator connected to receive actuation pulses from a single fluid input line,

wherein a pulse input causes an incremental change in fluid flow through said choke valve.

4,611,631

SOLENOID OPERATED POPPET TYPE CHANGE-OVER VALVE

Seiji Kosugi, and Hideyuki Takata, both of Soka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,305
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **10 Claims**

1. A solenoid operated poppet type change-over valve comprising:

(a) a valve body having:

(i) a valve chamber therein;

(ii) two oppositely directed cylindrical bores in fluid communication with said valve chamber, the interface between each of said oppositely directed cylindrical bores and said valve chamber defining oppositely directed, spaced valve seats; and

(iii) at least one fluid flow passage in fluid communication with one of said valve chamber and said two oppositely directed cylindrical bores;

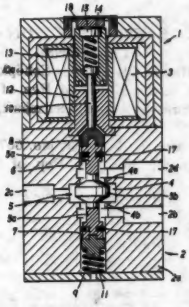
(b) a valve member comprising:

(i) a poppet type closure member disposed in said valve chamber and movable between a first position in which it valves one of said valve seats and a second position which it valves the other one of said vale seats and

(ii) two oppositely directed supporting rods, one of said two oppositely directed supporting rods extending from said closure member into one of said two oppositely directed cylindrical bores and the other one of said two oppositely directed supporting rods extending from said closure member into the other one of said two oppositely directed cylindrical bores, said supporting rods being sized, shaped, and positioned so that they do not contact the walls of said oppositely directed cylindrical bores;

(c) means for biasing said poppet type closure member into its first position;

(d) a solenoid operation section for driving said poppet type closure member into its second position against the force of said means;



(e) two resilient seal members, one of said two resilient seal members being mounted on each of said two oppositely directed supporting rods outboard of said at least one fluid flow passage, said seal members comprising means for preventing flow of working fluid outboard of said seal members; and

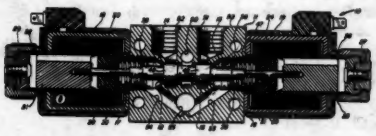
(f) two guide members made of synthetic resin, one of said two guide members being mounted on each of said two oppositely directed supporting rods outboard of an associated one of said two resilient seal members, each one of said two guide members being sized, shaped, and positioned to make sliding engagement with an associated one of said two oppositely directed cylindrical bores.

4,611,632

HYDRAULIC SOLENOID VALVE STRUCTURE

Abel E. Kolchinsky, Glenview, and Shaukat Kazi, Lincolnwood, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed May 6, 1985, Ser. No. 730,850
Int. Cl.[4] F15B *13/044*; F16K *31/06*
U.S. Cl. 137—625.65 **21 Claims**



1. In a hydraulic valve structure having a body defining a valve chamber and a plurality of ports opening to said chamber, a spool movably disposed in said chamber for selectively controlling fluid flow through said ports and defining an annular shoulder at one end of said valve chamber, and a solenoid having a plunger for selectively urging said spool toward the other end of said chamber as an incident of energization of said solenoid, the improvement comprising:

a tube extending coaxially about and slidably carrying said plunger, said tube defining a recess opening to said one end of said valve chamber;

a washer in said recess coaxially abutting said annular shoulder;

a compression spring in said recess coaxially of said plunger urging said washer toward said other end of the valve chamber; and

means retaining said spring and washer in association with said tube in said recess whereby the tube, spring and washer may comprise a selected one of a plurality of similar assemblies having similar tube and washer elements and different strength springs, permitting the selected tube assembly to have a spring strength coordinated with the characteristics of the spool.

4,611,633

EXPANSION HOSE FOR REDUCTION OF PRESSURE PULSATIONS

Peter Buchholz, Gifhorn; Claus-Peter Schöpke, Wasbüttel, and Rolf Warnecke, Gifhorn, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,540

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339876

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—26 **1 Claim**

1. In a hydraulic circuit an expansion hose for reducing pressure pulsations, the expansion hose comprising: an outer hose having a first hose chamber on an inlet side with an inlet end adapted to receive the pressure pulsations from the hydraulic circuit and a second hose chamber on an outlet side with an outlet end; a throttle element containing an axial throttle passage connecting the first and second chambers; and an inner hose connected at one end with the outer hose inlet end and having a portion extending through the first hose chamber and the throttle element and a portion extending into the second chamber, the inner hose further having its other end open so as to discharge directly into the second hose chamber, the portion of the inner hose within the first hose chamber having at least one radial throttle passage, and the portion of the inner hose within the second hose chamber having an imperforate wall.

4,611,634

HIGH PRESSURE ACCUMULATOR

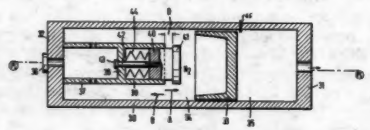
Wilfried Krückewitt, Kahl, and Horst Plettner, Hanau, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Sep. 26, 1984, Ser. No. 655,034

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334813

Int. Cl.[4] F16J *12/00*

U.S. Cl. 138—31 **7 Claims**



1. High pressure accumulator for supplying working fluid to a hydraulic control system, comprising:

a cylinder;

end walls disposed on ends of said cylinder;

a piston movable within said cylinder defining a working fluid space on one side of said piston for receiving working fluid to be discharged from said working fluid space to the hydraulic control system during a control step of the hydraulic control system and a gas space on the other side of said piston for receiving gas forming a gas spring;

a support tube projecting from one of said end walls into said gas space for limiting movement of said piston when pumping the working fluid back from the hydraulic control system into said working fluid space upon occurrence of gas loss in said gas space;

an abutment element against which said piston abuts during movement of said piston when pumping back the working fluid in said working fluid space upon occurrence of gas loss in said gas space;

spring means disposed between said abutment element and said support tube; and

pressure sensor means measuring the pressure in the working fluid corresponding to a given position of said piston after abuting against said abutment element and pressing down said spring means, for generating an early warning signal signifying too little gas being present in said gas space due to gas losses.

4,611,635

COATED PIPE HAVING BENDING CAPABILITY

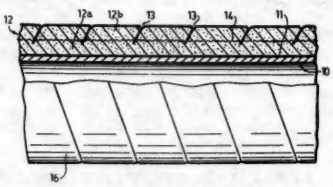
Harold F. Jarvis, Moffat, Canada, assignor to Shaw Industries Ltd., Rexdale, Canada

Filed Feb. 4, 1985, Ser. No. 698,146

Claims priority, application Canada, Feb. 22, 1984, 447994

Int. Cl.[4] F16L *9/16*

U.S. Cl. 138—146 **10 Claims**



1. A metal pipe having a protective coating consisting essentially of an inner, water-impermeable, corrosion barrier layer bonded to the pipe surface and an outer, water-permeable, concrete layer having a layer of mesh reinforcing material embedded therein, said concrete layer comprising a continuous inner portion covering the corrosion barrier layer and an outer portion which is helically slotted substantially to the depth of said reinforcing layer, the slot having axially offset inner and outer regions thereby defining a helical wrap in which adjacent convolutions overlap, said adjacent overlapping convolutions being articulately interconnected so permitting limited bending of the pipe.

4,611,636

REINFORCED UNDERGROUND PIPE

Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

Filed Jan. 31, 1985, Ser. No. 697,081

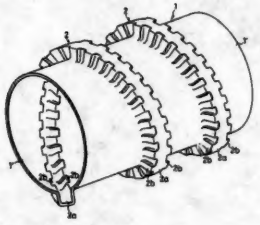
Claims priority, application Japan, Oct. 22, 1984, 59-221871

Int. Cl.[4] F16L *9/12*

U.S. Cl. 138—153 **8 Claims**

1. A reinforced underground pipe, comprising; a tubular body made of a synthetic resin, a helical reinforcing rib formed

on an outer surface of said tubular body, said rib having a pair of opposed side walls, and at least both said side walls being



regularly and continuously corrugated along their entire lengths.

4,611,637

REED FOR LOOMS

Samuel L. Huffman, Greenville, S.C., assignor to Carolina Plating Works, Greenville, S.C.

Filed Jun. 19, 1985, Ser. No. 746,408
Int. Cl.[4] D03D *49/62*
U.S. Cl. 139—192 **1 Claim**

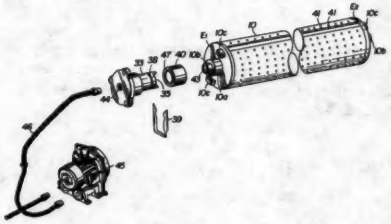
1. A reed particularly for high speed looms comprising a multiplicity of closely spaced parallel equal length reed wires, a bottom reed cap receiving and anchoring corresponding end portions of the reed wires and adapted to engage in and be held by a groove of a lay beam, and a top reed cap formed of light metal and receiving and anchoring top end portions of said reed wires and adapted to engage in and be held by a groove of a loom reed cap and by the bottom face thereof, said top reed cap having a length measured along the longitudinal axes of the reed wires which is substantially less than the length of the bottom reed cap measured along the axes of said wires, the top reed cap being provided on the opposite sides thereof with a pair of external substantially square cross section stiffening ribs whose top faces abut the bottom face of said loom reed cap on opposite sides of the groove of the loom reed cap, said stiffening ribs projecting equidistantly from the opposite sides of the top reed cap and being located substantially at the center of said opposite sides of the top reed cap.

4,611,638

AUTOMATIC TAKE-UP MOTION OF LOOM

Hideki Matumura, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 10, 1985, Ser. No. 753,572
Claims priority, application Japan, Jul. 12, 1984, 59-143214
Int. Cl.[4] D03D *49/20*
U.S. Cl. 139—304 **12 Claims**



1. A take-up motion apparatus for a loom, comprising:

a cloth roller which is hollow and includes a cylindrical section on which a woven cloth is wound, said cylindrical section being distributedly formed with a plurality of perforations through which a hollow inside of said cloth roller is communicable with atmospheric air;

means for rotatably supporting said cloth roller;

means defining a first communicating opening in said rotatably supporting means, said first communicating opening being in communication with the hollow inside of said cloth roller; and

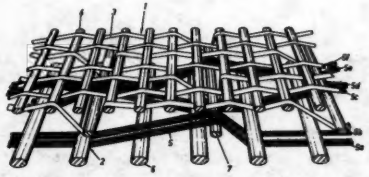
air suction means for sucking air from the hollow inside of said cloth roller through said first communicating opening.

4,611,639

FORMING FABRIC OF DOUBLE-LAYER TYPE

Hans J. Bugge, Halmstad, Sweden, assignor to Nordiskafilt AB, Halmstad, Sweden

Filed Feb. 13, 1984, Ser. No. 579,811
Claims priority, application Sweden, Feb. 23, 1983, 8300984
Int. Cl.[4] D03D *11/00, 15/02*
U.S. Cl. 139—383 A **1 Claim**



1. An improved open mesh double fabric for use in forming a fiber web in papermaking, cellulose and similar machines, said fabric comprising:

a first system of warp thread and a first system of weft threads, and a system of intermediate binder weft threads all warp threads of said first system of warp threads weaving with the first system of weft in a repeating pattern and certain of said first warp threads weaving also with said intermediate binder weft threads in a repeating pattern to form a first complete weave which during position of use of said fabric faces said fiber web to be formed thereon;

a second system of warp threads and a second system of weft threads,

warp threads of said second system of warp threads being

arranged in groups each such group comprising at least two adjacent warp threads disposed essentially in parallel with each other and weaving in a repeating pattern with weft threads of said second system of weft threads and with said intermediate binder weft threads;

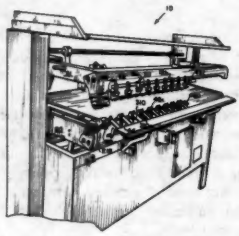
so as to join together said two complete weaves to form a double fabric.

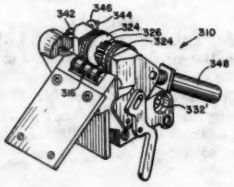
4,611,640

COIL SPRING ASSEMBLY APPARATUS

Garland A. Baker, Spring Lake, and Ronald S. Powers, Fennville, both of Mich., assignors to Holland Wire Products, Inc., Holland, Mich.

Filed Feb. 27, 1985, Ser. No. 706,314
Int. Cl.[4] B21F *21/00*
U.S. Cl. 140—92.3 **13 Claims**





1. A coil spring assembling machine comprising:

a row of upper fitting clamps and a row of lower fitting clamps, each row having an infeed end and a rear end, for clamping the upper and lower ends of a plurality of coil springs in a row;

upper and lower coil drive means at said infeed end, upstream of said rows of clamps, for helically feeding respective upper and lower helical coils toward and along said rows of clamps to connect the clamped coil springs at the respective tops and bottoms thereof;

at least one upper and one lower combination spring clamping and helical coil feeding unit in said row of clamps, each of said combination units having coil spring-clamping jaws and each having wire coil-advancing rollers to advance helical coils therethrough, said combination units being operable to separate said jaws and separate said rollers simultaneously for releasing both the clamped springs and the wire coils therefrom;

each of said combination units including a fixed member having a pair of spaced fixed jaws astraddle a grooved roller and a pivotal member having a pair of jaws astraddle a pair of grooved drive rollers, said rollers being arranged in planetary fashion to engage a helical coil.

4,611,641

GAS MIXING DEVICE AND METHOD

Jerie W. Carter, Sr., Ocoee, Fla., assignor to Mid-Florida Corporation, Orlando, Fla.

Filed Apr. 8, 1985, Ser. No. 720,971
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—4 **2 Claims**

1. A method of filling and mixing a plurality of gases in a gas storage cylinder comprising the steps of:

(a) disposing a gas inlet tube in and along the length of a gas storage cylinder, said tube having a plurality of openings through its walls, said openings distributed along the length of said tube;

(b) filling said cylinder with a first one of said gases having the lowest final gas pressure wherein said first gas is distributed along the entire cylinder;

(c) filling said cylinder with the second one of said gases having the next lowest final gas pressure wherein said second gas is distributed along the entire cylinder and is simultaneously mixed with said first gas; and

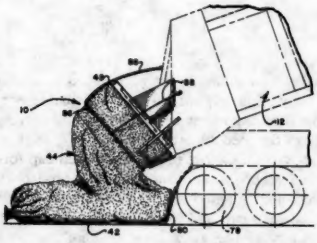
(d) repeating the step (c) above for each one of said plurality of gases.

4,611,642

BAG LOADING DEVICE FOR FLOWABLE SUBSTANCES

Neil E. Durhman, Prescott, Wis., assignor to General Feeds, Inc., St. Paul, Minn.

Filed Aug. 10, 1984, Ser. No. 640,032
Int. Cl.[4] B65B *1/06*
U.S. Cl. 141—114 **6 Claims**



5. Apparatus for directing a flowable substance from a transport location to a storage location, comprising:

a transport container supported on wheels, said transport container having a first bottom;

an elongated, flexible bag having a first portion resting on the ground and also having a second portion;

a housing formed as a tunnel, said housing having a second bottom;

means for attaching said housing to said transport container

so that said entire second bottom of said housing is inclined downwardly with respect to the first bottom of said transport container, said second bottom being adjacent to said transport container;

a ridge member attached to and encircling said housing, said ridge member for retaining a second portion of said bag from slipping off said housing when an open end and folded lengths of said bag are installed about said housing; and

means for selectively releasing some of the second portion of said bag as the first portion of said bag fills and pulls on the second portion;

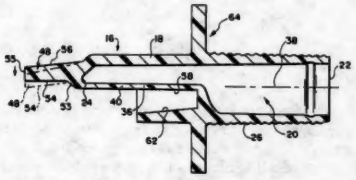
whereby said substance flows under the force of gravity from said transport container along said first bottom through said housing along said second bottom to said first portion of said bag on the ground, said second portion of said bag being pulled by said filling first portion for partial releasing by said releasing means to add to said first portion on the ground for further filling by said flowing substance.

4,611,643

INTERLOCKING FLUID TRANSFER DEVICE AND RESULTING ASSEMBLY

Susan M. Beebe, Glencoe; T. Michael Dennehey; Robert J. Kruger, both of Arlington Heights, and Brian D. Zdeb, Round Lake Park, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 21, 1983, Ser. No. 553,737
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—311 R **5 Claims**



4. A fluid transfer device operative by itself to seal the end of a conduit and operative, when two of said devices are connected together and exposed to heat energy, to open a path to conduct fluid between the two devices, said fluid transfer device comprising:

a generally tubular body including a sidewall peripherally enclosing a bore having an open end, which is attachable to the end of the fluid conduit to conduct fluid into said bore, and an oppositely axially spaced closed end, which seals said bore, and, thus, the attached conduit, said sidewall including a generally planar surface portion which has a centerline extending axially of said bore and which includes a region which is meltable, upon application of the heat energy, to form an opening communicating with said bore,

said generally planar surface portion of one of said devices being slidable against said generally planar surface portion of a second one of said devices to bring two of said meltable regions into operative registration,

coupling means comprising a tab portion and a slot portion, wherein said tab portion of said one device uniquely mates with a slot portion of said second device, and vice versa, only when said centerlines of said planar surface portions of said two devices align, said coupling means being operative, as said tab and slot portions are uniquely mated, for biasing said meltable regions into intimate contact as said registration between said meltable regions occurs and for thereafter releasably interlocking said two devices together to retain said meltable regions in said intimate contact, and

wherein said tab portion is resiliently deformable out of a normal position relative to said tubular body and

wherein said slot portion of said one device deforms said tab portion of the second of said devices out of said normal position, and vice versa, to bias said meltable regions toward said intimate contact, said tab portion being deformed as long as said two devices are releasably interlocked,

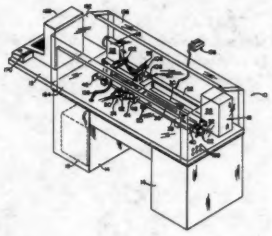
said meltable regions being operative, when in registration and intimate contact, for jointly melting upon exposure to the heat energy to open a fluid path between said two devices.

4,611,644

MANUAL AND AUTOMATIC TRACER LATHE

Robert W. Larson, 205 Dartmouth St., Warren, Pa. 16365

Filed Nov. 16, 1984, Ser. No. 672,195
Int. Cl.[4] B23B *3/28*
U.S. Cl. 142—7 **26 Claims**



1. A tracer lathe for cutting a work piece comprising:

a lathe base;

a work holding means attached to said lathe base for holding the work piece and for rotating the work piece about a longitudinal axis;

a cutting means attached to said lathe base for cutting the turning work piece, said cutting means including a cutting tool, a cutting holding means for holding said cutting tool, and a cutting base to which said cutting holding means is attached;

a longitudinal moving means operatively connected to said cutting base for cyclically moving said cutting means longitudinally along the work piece; and

a lateral moving means operatively connected to said cutting base for moving said cutting means laterally relative to the work piece to bring the cutting means into and out of engagement with the work piece as said cutting means is moved longitudinally by said longitudinal moving means, said lateral moving means including

(a) a manual advancing means operatively connected to said cutting base for incrementally advancing said cutting means toward the work piece to an advanced position after a longitudinal movement of said cutting means,

(b) a longitudinal pattern to be traced mounted to said lathe base, and

(c) an associated mechanical tracer means for tracing said pattern model as said cutting means is moved longitudinally and for moving said cutting means laterally away from the work piece and the advanced position according to said pattern model such that successively deeper or new cuts are made in the work piece according to said pattern model on each longitudinal movement and lateral advance of said cutting means; said mechanical

tracer means including a tracer head which is attached to said cutting means and which moves longitudinally with said cutting means while riding along said pattern model, a connection means for moving said cutting means laterally as said tracer head is moved laterally by contact with said pattern model during the longitudinal movement of said tracer head and cutting means, a tracer base on which said tracer head is oriented, and a tracer mounting means for mounting said tracer base for lateral movement on said cutting base; and

wherein said manual advancing means includes a manual motor means operatively connected to said tracer base for selectively laterally moving said tracer base relative to said cutting base to move said tracer head relative to said cutting tool and a constant bias spring means for resiliently urging said cutting base toward the work piece until said tracer head engages said pattern model such that said tracer head is resiliently biased against said pattern mode as said tracer head moves longitudinally with said cutting means and the bias on said tracer head does not vary as the separation between said tracer head and said cutting means is changed by said manual advancing means.

4,611,645

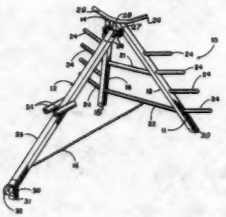
CREEL APPARATUS FOR ELECTRICAL WIRE

Daniel H. Whisnant, 906 Mable St., Mableton, Ga. 30059

Filed Apr. 22, 1985, Ser. No. 725,911

Int. Cl.⁴ B65H *49/38, 49/00, 49/16*

U.S. Cl. 242—129.5 **8 Claims**



1. A creel apparatus, for reels of electrical wire or the like, said creel apparatus comprising a creel member and a support member pviotal with respect to said creel member, said creel member including stanchions for supporting said creel member, and a plurality of spindles extending from said creel member, said support member including limiting means for limiting the outward pivotal motion of said support means with respect to said creel member, the arrangement being such that said creel apparatus is supported on said stanchions and said support member, said support member further including strand guide means for collecting strands from said plurality of spindles.

4,611,646

WORKPIECE-CENTERING TWO-SIDED PLANER

Paul Wassmer, Heitersheim, and Fritz Schake, Bad Hersfeld, both of Fed. Rep. of Germany, assignors to Kupfermuhle Holztechnik GmbH, Hersfeld, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,613

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316857

Int. Cl.⁴ B27C *1/08*

U.S. Cl. 144—117 R **11 Claims**

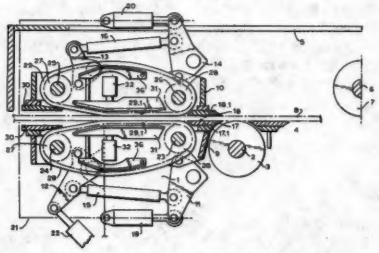
1. An apparatus for planing opposite sides of a workpiece, the apparatus comprising:

a housing having a lower part and an upper part flanking a passage through which the workpiece to be planed is passed horizontally in a travel direction;

respective upper and lower planing drums rotatable on the respective housing parts above and below the passage about respective upper and lower axes extending transverse to the direction and defining on such rotation respective upper and lower cutting orbits centered on the respective axes, the lower drum being upstream of the upper drum relative to the workpiece travel direction, the lower drum being upstream relative to the travel direction from the upper drum;

a stationary workpiece support table between the drums and having a planar upper surface level and tangent with the lower orbit, whereby the lower side of a workpiece passed in the direction over the lower drum is planed and slides downstream of the lower drum on the table surface;

respective upper and lower guide plates having vertically confronting faces upstream of the lower drum and being vertically displaceable on the respective housing parts between inner positions with the upper-plate face and lower-plate face level and tangent with the respective orbits and outer positions respectively vertically thereabove and therebelow;



link means interconnecting the upper and lower plates for substantially synchronously and oppositely displacing the plates so that same are always equispaced from a horizontal plane extending horizontally in the direction and vertically equispaced from the upper and lower orbits;

biasing means connected to the plates for urging the plates into the inner positions; and

respective upper and lower transport means each comprising

a plurality of downstream wheels immediately adjacent the respective plate, respective upstream wheels upstream from the downstream wheels and vertically offset therefrom away from the passage, and respective endless traction elements spanned between the wheels and having respective stretches exposed in the passage, the stretches forming respective upper and lower confronting workpiece gripping surfaces immediately upstream of the respective plate faces and advanceable in the travel direction for feeding the workpiece between the plates, the transport surfaces converging in the travel direction and having extreme downstream portions generally level with the respective plate faces.

4,611,647

AGRICULTURAL AND INDUSTRIAL TRACTOR TIRES

Giovanni Rimondi, Milan, Italy, assignor to Societa' Pneumatici Pirelli Societa per Azioni, Milan, Italy

Filed May 23, 1984, Ser. No. 612,918

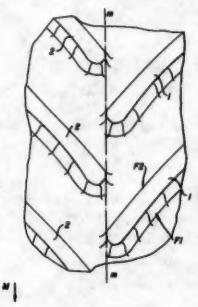
Claims priority, application Italy, May 24, 1983, 21239 A/83

Int. Cl.⁴ B60C *11/11*

U.S. Cl. 152—209 B **5 Claims**

1. A pnematic tire for agricultural and industrial tractors provided with a tread comprising a plurality of lugs arranged one after the other around the circumference of the tire in two

contiguous distinct series offset one with respect to the other, on opposite sides with respect to the equatorial plane of the tire, the lugs of each series extending obliquely from the tread edge toward said equatorial plane and being spaced apart from one another in a circumferential sense, each lug presenting a straight section perpendicular to the axis of the lug, of approximately trapezoidal shape, presenting two sidewalls, a front sidewall and a back sidewall, respectively, with reference to the running direction of the tire, characterized in that the front



sidewall of said lugs presents, in cross-section, a curvilinear profile portion, convex toward the outside, radially developed toward the inside starting from a point (K) on the radially outer surface of said lug as far as a point (P), where the curvature of said profile is null or is reversed, said profile being defined by the equation:

$$y=Ax^3+Bx^2-Cx \quad (1)$$

where

$$A=\frac{2h}{b^3}-\frac{tgv+tgw}{b^2} \quad (2)$$

$$B=\frac{-3h}{b^2}+\frac{tgv+2tgw}{b} \quad (3)$$

$$C=tgw \quad (4)$$

wherein, respectively, h and b are the depth with respect to the radially outer surface and the distance, parallel to said surface of point P from the point K where the curvilinear profile begins, v and w are the angles referred to the direction perpendicular to the radial direction, respectively, formed by the tangents to the profile at points P and K, and x and y are the coordinates of a general point on said profile.

4,611,648

UNITIZED SECONDARY GLAZING FRAME AND VENETIAN BLIND ASSEMBLY

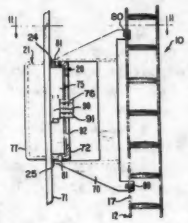
Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Continuation of Ser. No. 455,526, Jan. 4, 1983. This application Dec. 13, 1984, Ser. No. 681,089

Int. Cl.[4] E06B *3/24*

U.S. Cl. 160—107 **7 Claims**

1. A double glazing construction including two spaced glazings having a venetian blind assembly positioned therebetween with said blind assembly including a plurality of tiltable slats, a drive cable for tilting said slats, an operating element for moving said drive cable; characterized in that said operating element is linearly movable along a surface of one of said glazings facing said blind assembly and in having a connecting member pivotally mounted at one end to said drive cable and at an opposite end to said operating element to pivot in a plane perpendicular to the direction of linear movement of said



operating element whereby the distance between the operating element and the drive cable may be varied.

4,611,649

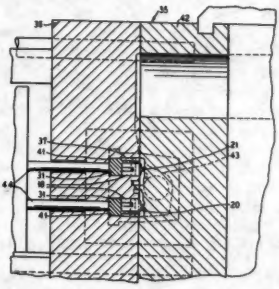
METHOD OF MAKING MULTIPLE MAGNET CORE UNITS

Phillip Zelkowitz, Lincolnwood, Ill., assignor to Albany-Chicago Corporation, Chicago, Ill.

Division of Ser. No. 444,346, Nov. 24, 1982, Pat. No. 4,540,966. This application Apr. 30, 1985, Ser. No. 729,151

Int. Cl.[4] B22D *29/00, 19/16, 19/04*

U.S. Cl. 164—108 **7 Claims**



2. The method of making die castings of one metal with a row of spaced fingers of another metal in fixed integral relation which comprises mounting the fingers in slots of an elongated holder which are open on one side and on one end with the fingers projecting through the open ends of the slots while remaining flush with the open sides of the slots, mounting the holder in a die of a casting machine having a molding cavity surrounding the portions of the fingers projecting through the open ends of the slots, die casting metal around the projecting portions of the fingers to form a frame for the fingers, ejecting the casting and holder from the machine, and stripping the holder from the fingers to provide a finished casting with the fingers precisely positioned on the frame.

4,611,650

SOCKET CORE SUPPORT DEVICE FOR CENTRIFUGAL PIPE CASTING MACHINE

Pierre Fort, Nancy, and Michel Pierrel, Pont a Mousson, both of France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed May 11, 1984, Ser. No. 609,247

Claims priority, application France, May 11, 1983, 83 07939

Int. Cl.[4] B22D *33/04*

U.S. Cl. 164—298 **4 Claims**

1. An apparatus for supporting and positioning a sintered

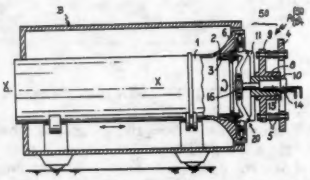
sand socket core (3) in an open end of a horizontally oriented centrifugal chill-mould (1) for casting iron pipes (T), comprising:

(a) an annular metal seat (24) for coaxially engaging and supporting a socket core,

(b) a head member (50) disposed coaxially outwardly of the seat with respect to the open mould end,

(c) a plurality of dogs (20) mounted on the head member and selectively actuable to directly engage within an accommodating annular coaxial recess (51) defined within the seat to thereby grip and release the seat and enable the positive retention thereof by the head member dogs, and

(d) a plurality of mechanisms (27) mounted on the seat for automatically gripping a socket end (6) of the chill-mould, whereby the head member may be engaged with the seat and a socket core mounted on the latter, the head member,



seat and socket core assembly positioned proximate and within the socket end of the mould, the seat gripped to said socket end, and the head member released and withdrawn from the seat to enable centrifugal casting,

(e) wherein the dogs are distributed around a longitudinal axis (X—X) of the seat and head member, articulated around axes (Z—Z') orthogonal to the said longitudinal axis, and are actuated by a jack (13) coaxially mounted on the head member,

(f) wherein the annular coaxial recess (51) receives end claws (22) of the dogs, and

(g) wherein the dogs are articulated on arms (11) supported by a shaft (10) concentric to the jack, ends (12) of said arms bearing against a bottom (33) of the seat recess when the head member is engaged with the seat, and ends of the dogs remote from the class comprise forks (19) articulated in posts (17) fixed on a head (16) of a rod (15) of the jack.

4,611,651

METHOD AND APPARATUS FOR CONTINUOUS CASTING OF METAL PIPE WITH INTEGRAL END FITTING

Yves Gourmel; Michel Pierrel, and Rio Bellocci, all of Pont-A-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Jul. 12, 1984, Ser. No. 630,043

Claims priority, application France, Jul. 12, 1983, 83 11788

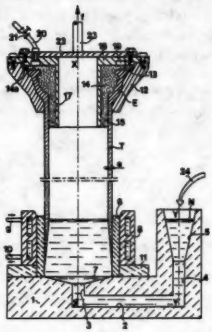
Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—464 **17 Claims**

1. A process for the continuous, vertically ascending casting of a tubular pipe shank (T) and integral end fitting (E) by bottom loading with molten metal, said process employing a core (14) to mold the interior shape of the end fitting and a cylindrical crucible forming a draw tube (5) to mold the exterior shape of the pipe shank, wherein the draw tube is externally cooled, and wherein the pipe shank is formed by the ascending extraction of solidified metal, step by step, out of the draw tube, characterized by the steps of:

(a) sealingly disposing a housing (12; 25) atop an upper end of the draw tube and surrounding the core to define therebetween an outwardly flared annular space (16) configured as a female bell housing adapted to receive a male pipe end during installation, and

(b) before the step by step forming of the pipe shank by ascending extraction, including molten metal in the crucible to rise into and fill said annular space to form the end



fitting and an integral initial section of pipe shank, said housing defining the exterior shape of the end fitting.

4,611,652

METHOD OF PREVENTING CORROSION IN BOILER-PLANT EQUIPMENT

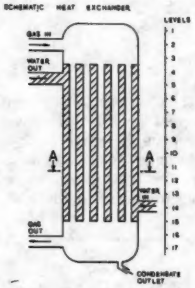
Ragnar L. H. Bernstein, Solbacksvagen 67, Fagersta, Sweden (S-773 00), and Lars A. Tiberg, Postlada 4201, Vad, Soderbarke, Sweden (S-770 20)

Continuation of Ser. No. 362,506, Mar. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 348,828, Feb. 16, 1982, abandoned, which is a continuation of Ser. No. 232,661, Feb. 9, 1981, abandoned. This application Oct. 4, 1984, Ser. No. 658,058

Claims priority, application Sweden, Feb. 14, 1980, 8001144

Int. Cl.[4] F28F *19/00, 21/08*

U.S. Cl. 165—1 **18 Claims**



1. A method for preventing corrosion in a combustion plant wherein heat is abstracted from the combustion gases, i.e., flue gases, including from said flue gases at temperatures below an acid dew point for said flue gases, said heat being abstracted in a heat exchanger zone, having a hot side of a heat transfer surface of stainless steel, including preventing corrosion of said heat transfer surfaces as well as ducts, flues and chimney parts thereof, said corrosion being occasioned by combustion by-products including sulfur trioxide, sulfur dioxide, sulfuric acid and the like, and other aggressive corrodents formed during combustion, said method comprising:

(a) passing combustion products, such as said flue gases, from a combustion zone to said heat exchanger zone

where said heat transfer surfaces are of stainless steel and are exposed to said combustion products;

(b) maintaining the heat transfer surfaces exposed on the opposite side of said combustion gases to a cooling medium which is either

(i) at a constant temperature or

(ii) at a temperature difference which, relative to a temperature for said combustion gases, is between an initial combustion gases temperature which contacts the cooling medium and an initially entering cooling medium temperature, wherein said cooling medium temperature is decreasing in a direction of flow of said combustion gases as the combustion gases decrease in temperature, said temperature difference between said combustion gases and said cooling medium approaching a smaller difference or approaching a substantially relatively constant temperature difference between said combustion gases exiting said heat exchanger zone and said cooling medium entering said heat exchanger zone with the cooling medium temperature being below said temperature for said combustion gases;

(c) condensing on the heat transfer surface exposed to said combustion products corrosively aggressive condensates, including sulfuric acid and the like, at a temperature below the acid dew point of said combustion gases;

(d) maintaining the hot side of said heat transfer surface, by cooling, at a temperature below an upper permitted wall temperature, and

(e) wherein the heat transfer surfaces are arranged vertically with the combustion gases passing vertically downwardly on one side of said heat exchanger vertical surfaces and the cooling medium passing on the opposite side of said heat exchanger surfaces.

4,611,653

VENTILATION SYSTEM

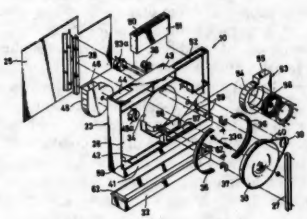
Akio Ikemura, Kurobe, and Minoru Kajiki, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,590

Claims priority, application Japan, Jul. 10, 1984, 59-104179[U]

Int. Cl.⁴ F28D *19/00*

U.S. Cl. 165—54 **3 Claims**



1. A ventilation system, comprising:

(a) a wall or window unit having a frame composed of a plurality of hollow structural sections defining a heat-medium passageway for circulation of a heat medium through said frame;

(b) a housing supported on said frame and divided into first and second inner chambers and first and second outer chambers, said housing having a first opening for communication between said first inner chamber and the interior, a second opening for communication between said first outer chamber and the exterior, a third opening for communication between said second outer chamber and the exterior, and a fourth opening for communication between said second inner chamber and the interior;

(c) a heat-exchanger rotor rotatably mounted in said housing and providing communication between said first inner and outer chambers and also between said second inner and outer chambers;

(d) a discharge fan mounted in said first outer chamber for delivering air from the interior to the exterior via said second opening;

(e) a supply fan mounted in said second inner chamber for delivering air from the exterior to the interior via said fourth opening; and

(f) a preliminary heat-exchanger unit supported on said housing and connected to said fourth opening for prewarming and precooling, selectively, air from the exterior before the air passes through said heat-exchanger rotor, said preliminary heat-exchanger unit having a radiation-/endothermy tube connected to said heat-medium passageway for communication therewith.

4,611,654

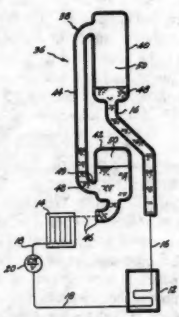
PASSIVE SYSTEM FOR HEAT TRANSFER

Christian K. E. Buchsel, 18503 SE. 64th Way, Issaquah, Wash. 98027

Filed Jan. 23, 1985, Ser. No. 693,805

Int. Cl.⁴ F28D *15/00*

U.S. Cl. 165—104.22 **11 Claims**



1. An improved heat transfer system of the type including a heat collector, a heat sink, a collector drain duct, a collector feed duct, and a check valve, wherein the heat sink is positioned below the heat collector, the heat collector is in fluid communication through the collector drain duct with the heat sink, the heat sink is in direct fluid communication through the collector feed duct with the heat collector, and the check valve is positioned in the system to prevent back flow from the heat collector through the collector feed duct to the heat sink, the improvement in combination therewith comprising a passive circulation unit, the passive circulation unit being partially evacuated of air and consisting of an upper chamber, a lower chamber, and a vent duct, the upper and lower chambers being disposed in vertical array, the lower end of the lower chamber being disposed above and in fluid communication with the heat collector, the lower and upper chambers being in fluid communication through the vent duct, the vent duct leading from the lower region of the lower chamber to the upper region of the upper chamber, and the lower region of the upper chamber being in fluid communication through the collector drain duct with the heat sink, the passive circulation unit adapted to receive working fluid liquid and working fluid vapor from the heat collector and to deliver only working fluid liquid to the collector drain duct.

4,611,655

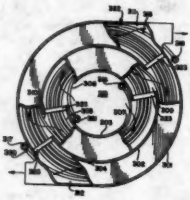
HEAT EXCHANGER

Albert J. Molignoni, Butte, Mont., assignor to Power Shaft Engine, Limited Partnership, Butte, Mont.

Continuation-in-part of Ser. No. 695,284, Jan. 28, 1985, abandoned, which is a division of Ser. No. 554,603, Nov. 23, 1983, Pat. No. 4,561,256, which is a continuation-in-part of Ser. No. 455,745, Jan. 5, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 788,827

Int. Cl.[4] F28D *21/00*

U.S. Cl. 165—163 **10 Claims**



1. A heat exchanger comprising wall means including concentric cylindrical first and second walls forming at least one annular chamber, a plurality of tubes positioned in said chamber, said walls having a central axis and each of said tubes spiraling about said axis, said tubes being spaced apart in the direction of said axis and each of said tubes forming a generally flat coil in said chamber, each of said tubes having outer and inner ends adapted to be connected to means for flowing a first fluid through said tubes, and said wall means having inlet and outlet openings formed therein enabling a second fluid to be flowed through said annular chamber and around said tubes.

4,611,656

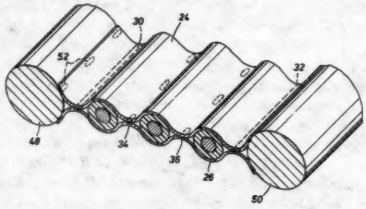
PROTECTIVE JACKET ASSEMBLY

Clarence E. Kendall, Jr., 3827 Wickersham, Houston, Tex. 77027, and Boyd B. Moore, 427 Mignon, Houston, Tex. 77024

Continuation-in-part of Ser. No. 691,483, Jan. 14, 1985, abandoned, which is a continuation of Ser. No. 575,218, Jan. 30, 1984, abandoned, which is a continuation of Ser. No. 453,360, Dec. 27, 1982, abandoned, which is a division of Ser. No. 247,526, Mar. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 000,017, Dec. 29, 1979, abandoned. This application Sep. 11, 1985, Ser. No. 774,985

Int. Cl.[4] E21B *17/10*; F16L *11/12*; B21D *39/03*; H01B *7/24*

U.S. Cl. 166—65.1 **62 Claims**



1. For use in production of oil, gas and other fluid materials from subsurface formations, a crush and abrasion resistant protective jacket assembly adapted to be suspended in an oil or gas well which may have a corrosive, high temperature, high pressure gas and/or liquid environment, said protective jacket assembly being sufficiently flexible to permit reeling and unreeling during manufacture and installation in a well bore and bending to accommodate well bore deviation, said protective jacket assembly comprising:

(a) elongated conductor means extending in unbroken manner the length of said protective jacket assembly;

(b) a first metal sheet extending the length of said protective jacket assembly and being formed to define at least one elongated conductor groove means;

(c) a second metal sheet extending the length of said protective jacket assembly and being formed to define elongated conductor groove means, said first and second metal sheets being placed in assembly with said conductor groove means thereof cooperating to define elongated conductor passage means extending the length of said protective jacket assembly;

(d) a pair of elongated continuous welds securing said meal sheets in sealed assembly on either side of said elongated conductor passage means, said sheets and said welds cooperating to define elongated sealed protective metal sheath means extending the length of said protective jacket assembly, said metal sheath means including said elongated conductor passage therein; and

(e) a pair of metal longitudinal structural elements being positioned at opposed sides of said metal sheath means and being structurally interconnected with at least one of said metal sheets, along the length thereof, said longitudinal structural elements having at least a part thereof exposed for guiding and protective contact with well casing and other objects with which it comes into contact as said protective jacket assembly is installed in or removed from a well, said longitudinal structural elements resisting crushing of said metal sheath means and said conductor means when said protective jacket assembly is located in a bore hole or in the annulus between the tubing and the casing of a bore hole, said longitudinal structural elements also resisting longitudinal compressive and longitudinal tensile forces and being capable of supporting the weight of said protective jacket assembly and conductors included therein when installed within a well.

35. A method of manufacturing a protective jacket assembly having longitudinal structural elements connected at opposed sides thereof, said method comprising:

(a) moving a plurality of conductors and a pair of longitudinal structural elements linearly through an assembly station;

(b) withdrawing a pair of elongated metal sheets from a metal sheet supply and simultaneously transporting said metal sheets into said assembly station;

(c) roll forming said metal sheets so as to define a plurality of grooves in each of said metal sheets;

(d) bringing said roll formed metal sheets into assembly with said conductors and said longitudinal structural elements in such manner that said grooves of each of said metal sheets receive respective ones of said conductors and the outside edge portions of said metal sheets engage respective ones of said longitudinal structural elements;

(e) establishing elongated seals between said formed metal sheets to define a protective metal sheath containing said conductors; and

(f) establishing structural interconnections between the outside edge portions of said sheath and said longitudinal structural elements.

4,611,657

PITLESS ADAPTOR BY-PASS

Garry L. Doering, Box 1469, Olds, Alberta, Canada (T0M 1P0)

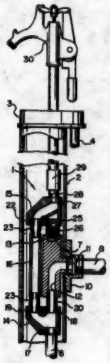
Filed Nov. 21, 1984, Ser. No. 674,110

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—88 **8 Claims**

1. A bypass for a pitless adapter of the type including a body containing a 90 degree passage for diverting water in a well casing from a vertical drop pipe to a horizontal service line, said bypass comprising first manifold means for mounting between said drop pipe and said adapter body; first inlet means

in said first manifold means for receiving water from said drop pipe; first outlet means in said first manifold means for discharging water into said 90 degree passage; second outlet means in said first manifold means; bypass tube means for receiving water from said second outlet means; second manifold means for mounting at the top end of said adapter body; second inlet means in said second manifold means for receiving water from said bypass tube means; and third outlet means in said second manifold means for discharging the water to a hydrant or the like at the top of the well casing.



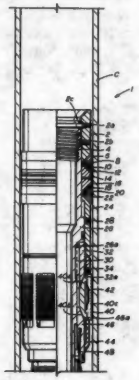
4,611,658

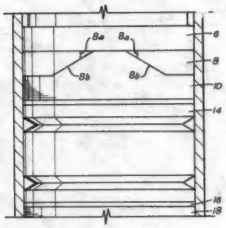
HIGH PRESSURE RETRIEVABLE GRAVEL PACKING APPARATUS

John V. Salerni, Kingwood, and Rodney J. Wetzel, The Woodlands, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Sep. 26, 1984, Ser. No. 654,142
Int. Cl.[4] E21B *33/128, 33/129*
U.S. Cl. 166—134 **4 Claims**

1. A retrievable well tool for use in maintaining sealing integrity between inner and outer concentric conduits under high temperature and pressure conditions in a subterranean well, the well tool comprising: an annular packing element at least partially plastically deformable at the well temperature and pressure, the packing element being initially radially expandable under axial compression; first and second relatively axially shiftable annular shoulders respectively disposed on opposite sides of said packing element, at least one of said shoulders being movable towards and away from the other shoulder; radially expandable, axially split backup rings between each shoulder and the packing element, the backup rings being radially expandable into abutment with the inner surface of the outer conduit upon movement of the first and second shoulders toward each other to compress the packing element, thereby opening an axial gap at the location of said axial split in each said backup rings; said axial split being defined by oppositely inclined surfaces facing said packing element; and a resiliently deformable barrier member disposed between each said backup ring and said packing element, said barrier members being resiliently deformable upon radial expansion and contraction of the backup rings, whereby said axial gaps in said backup rings adjacent the outer conduit are respectively sealed by expansion thereinto of portions of said barrier members; said oppositely inclined surfaces acting on said portions of said barrier elements to displace said portions from said axial gap and permit said backup rings to contract by movement of at least one of said annular shoulders away from the packing element, thereby permitting retrieval of the well tool.





4,611,659

OXIDIZED ALKALI LIGNINS AND THEIR USE IN ENHANCED OIL RECOVERY

Francis E. DeBons, Richmond, Tex.; Larry D. Pedersen, Canal Winchester, Ohio; David K. Olsen, Bartlesville, Okla., and William C. Richardson, Bellaire, Tex., assignors to Getty Oil Company, Houston, Tex. and Reed Lignin, Inc., Greenwich, Conn.

Filed Jul. 2, 1984, Ser. No. 626,750
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **7 Claims**

1. A method of enhanced oil recovery from a subterranean formation containing oil and having at least one production well and at least one injection well comprising:

injecting into said formation a surfactant system comprising:

a surfactant selected from at least one of the classes of anionic and nonionic surfactants and

an ozonized alkali lignin;

driving said surfactant system through said formation; and

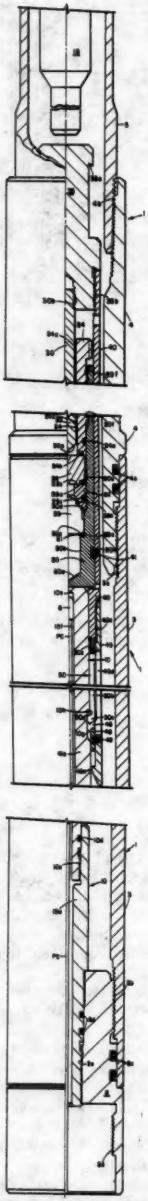
producing the oil mobilized by said surfactant system through said production well.

4,611,660

WIRELINE CONVEYED FIRING MECHANISM FOR WELL PERFORATING GUN

Gregg W. Stout, Montgomery, and Elmer R. Peterson, Houston, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 6, 1985, Ser. No. 742,097
Int. Cl.[4] E21B *43/116*
U.S. Cl. 166—297 14 Claims



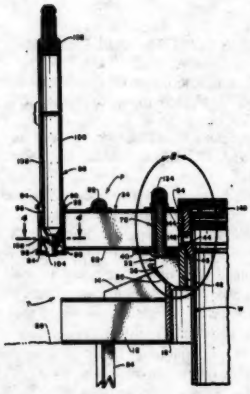
1. A replaceable firing mechanism for a subterranean well perforating gun, comprising: a first hollow housing attachable to the top end of a perforating gun and having a thin walled top end surface closing the bore of the hollow housing; a detonatable firing element positioned within said first hollow housing and operatively connected to said perforating gun; a wireline carried firing assembly including a second housing having a thin walled bottom end surface; an impact detonatable primer fixedly mounted in said housing; a hammer axially slidable in said second housing between a remote and contiguous position relative to said primer; a wireline attached member fixedly secured to said hammer; means secured to said wireline attachable member for detachably engaging said first and second hollow housings, whereby said solid end of said second housing may be positioned in vertical abutment to said top end surface of said first housing; and means for transferring the detonating energy of said primer to said detonatable firing element, whereby a downward impact force on said wireline attachable member will sequentially detonate said primer, said detonatable firing element and said perforating gun.

4,611,661

RETRIEVABLE EXPLORATION GUIDE BASE/COMPLETION GUIDE BASE SYSTEM

Jon E. Hed, and Robert B. Draper, both of Ventura, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Apr. 15, 1985, Ser. No. 723,023
Int. Cl.[4] E21B *33/035, 43/01*
U.S. Cl. 166—339 7 Claims



1. A system for converting a subsea exploratory well into a production well, said well including a temporary guide base located subsea with guide lines extending to the water surface and a central opening through which drilling operations are conducted;

a retrievable permanent guide base adapted to be lowered onto said temporary guide base and guided thereto by said guide lines;

said permanent guide base comprising two parts,

one part including gimbal means adapted to engage said temporary guide base, and

a second part including platform means, means for releasably latching said platform to said gimbal means, and a centrally located sleeve for carrying and directing a well-

head housing through said opening in said temporary guide base;

said platform means being separated and retrieved to the water surface leaving said gimbal means on said temporary guide base as part of said conversion,

and a completion guide base having equipment for producing from the well which, when lowered to the well, lands on the gimbal means.

7. A method of converting a subsea exploratory well into a production well comprising the steps of;

locating a temporary guide base on a subsea mud line,

providing a permanent guide base in two parts latched together,

providing a wellhead housing with an external latching profile and assembling said two parts of said permanent guide base and said wellhead housing together and lowering the assembly onto said temporary guide base,

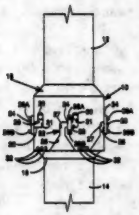
releasing part of said permanent guide base leaving the second part of said permanent guide base and said wellhead housing subsea,

providing a completion guide base with equipment for producing from the well and lowering said completion guide base onto said temporary guide base.

4,611,662
REMOTELY OPERABLE RELEASABLE PIPE CONNECTOR

John P. Harrington, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed May 21, 1985, Ser. No. 736,595
Int. Cl.[4] E21B 7/20, 17/046, 17/06
U.S. Cl. 166—339 1 Claim



1. A method of completing a surface casing in a seafloor comprising:

cooperatively disposing a second tubular body connected to a pipe over a first tubular body connected to a first end of a length of surface casing, whereby at least one laterally extending member connected to the exterior of the first tubular body is retained within at least one slot in the second tubular body;

removably attaching at least one shear plate to the exterior of the second tubular body across the at least one slot to retain the at least one laterally extending member therein;

driving a second end of the length of surface casing into the seafloor;

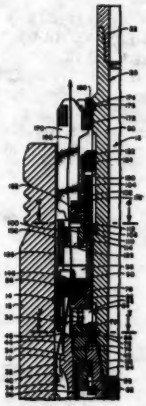
rotating the second tubular body relative to the first tubular body with sufficient force to cause the at least one laterally extending member to shear the at least one shear plate; and

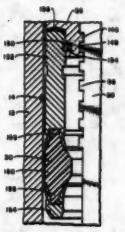
removing the second tubular body from being disposed over the first tubular body.

4,611,663
CASING HANGER AND RUNNING APPARATUS

Gregg A. Goris, Oxnard, and John Pettit, Camarillo, both of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Apr. 2, 1985, Ser. No. 719,383
Int. Cl.[4] E21B 43/10
U.S. Cl. 166—382 27 Claims





1. An apparatus for supporting a tubular string extending into a well bore from a surrounding wellhead, comprising;

a hanger body adapted to be located in the wellhead and having internal and external threads thereon and at least one sealing surface;

a running tool connectable to a running string;

means releasably connecting said hanger body to said running tool to enable said hanger body to be lowered into the wellhead;

packoff means;

means for supporting said packoff means separately from said hanger body and above said sealing surface while said hanger body is connected to said running tool; and

means for disconnecting said packoff means from said supporting means as said releasable connecting means is released from said hanger body, and for moving said packoff means downwardly of said hanger body towards said sealing surface and effecting its sealing engagement of said packoff means with said sealing surface by actuation of said packoff means.

26. A method of lowering and sealing a casing hanger in a wellhead comprising the steps of;

attaching apparatus onto a running tool which has a casing hanger and a packoff assembly thereon,

connecting said running tool and apparatus onto a means for

lowering and rotating said running tool into a wellhead located subsea,

positioning said casing hanger in said wellhead, said casing hanger being adapted for that purpose,

rotating said running tool to release said casing hanger and said packoff assembly from said running apparatus and said packoff assembly to become connected to said casing hanger and to seal said casing hanger with respect to said wellhead.

4,611,664

TECHNIQUE FOR PLACING A LIQUID CHEMICAL IN A WELL OR BORE HOLE

M. Glenn Osterhoudt, III, and Vernon L. Green, both of Corpus Christi, Tex., assignors to Petro-Stix, Inc., Corpus Christi, Tex.

Filed Jan. 31, 1985, Ser. No. 697,123
Int. Cl.[4] E21B *37/06*; B65D *85/84*
U.S. Cl. 166—902 17 Claims

1. A technique for placing a liquid chemical into a well penetrating the earth, comprising

pouring the chemical into a carrier digestible by the chemical;

dropping the carrier into the well and moving the carrier toward the bottom of the well; and

generating a hole in the carrier, while inside the well, by digesting the carrier to a substantial extent from the inside out with the chemical allowing the liquid chemical to escape from the carrier into the well.

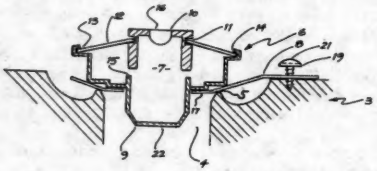
12. A well treating assembly comprising a container having a longitudinal dimension and a transverse dimension, the transverse dimension being substantially less than the longitudinal dimension and being sufficiently small to pass into oil field tubular goods and a liquid chemical in the container, the container being digestible in the liquid chemical to release the liquid chemical in a time period less than two hours at ambient temperature and pressure.

4,611,665

SPRINKLER HEAD VALVE MEANS

Barry F. Byrne, Killarney Heights, Australia, assignor to Wormald International Limited, Crows Nest, Australia

Filed Sep. 20, 1984, Ser. No. 652,826
Claims priority, application Australia, Sep. 27, 1983, PG1591
Int. Cl.[4] A62C *37/14*
U.S. Cl. 169—37 3 Claims



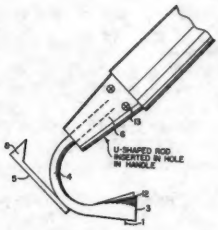
1. Valve means for sealing closed the fluid supply orifice in a sprinkler head body, comprising a sealing plug provided with a projection facing towards said orifice when said plug is assembled upon said body, and a resilient membrane having an annular portion positioned over said projection to capture said plug and serving to seal closed said orifice when compressed between said plug and said body and the membrane also having a tail portion on said annular portion attachable to said body to deflect said plug out of the path of a fluid jet issuing from said orifice when said orifice is opened, and a depending O-ring being integrally formed on said annular portion of the resilient membrane said O-ring having a diameter for close fitting within said orifice to assist in sealing closed said orifice.

4,611,666

SIDEWALK AND CURB CREVICE WEEDER

Edward Albertson, 1070 W. Ocean View Ave., Norfolk, Va. 23503

Continuation-in-part of Ser. No. 521,845, Aug. 10, 1983, Pat. No. 4,546,831. This application Jun. 25, 1985, Ser. No. 748,625
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.[4] A01B *1/16, 1/20*
U.S. Cl. 172—13 11 Claims



1. A weeder device for removing undesirable growth occurring in cracks, crevices and sidewalk-road interfaces, comprising:

a V-shaped cutting head at one end of a U-shaped rod, said V-shaped cutting head including a pointed base portion and two leg portions, each of said leg portions having first ends which are joined together to form said pointed base portion and second ends, which are free ends, said second ends each being substantially the same distance from the U-shaped rod as said pointed base portion, said pointed base portion and two leg portions forming a sharpened flat leading edge for protruding into narrow cracks, the pointed base portion of said V-shaped cutting head extending toward the exterior of the U-shaped rod, such that when the weeder is in its use position, the pointed base portion is the outermost point of the weeder and is the first portion to contact undesirable growth in a crack or crevice; and

a second end of the U-shaped rod is connected to a handle by which the sharpened flat leading edge of the V-shaped cutting head may be drawn in and along cracks and crevices.

4,611,667

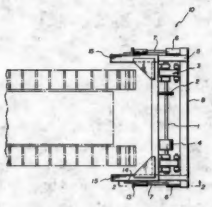
RECIPROCATING BULLDOZER BLADE

Emery C. Tharp, 468-B Costa Mesa Dr., Greenwood, Ind. 46142

Filed Oct. 28, 1981, Ser. No. 315,755
Int. Cl.[4] A01B *35/00*
U.S. Cl. 172—40 1 Claim

1. An improvement on a reciprocating bulldozer which includes a support arm carried on the bulldozer, a telescoping member slidably disposed within the support arm upon which telescoping member a bulldozer blade is provided, a cam disposed between the support arm and the telescoping member to

provide horizontal oscillatory motion therebetween, the cam operatively connected to a power shaft having an output sprocket engaging a means for rotating the power shaft, the improvement comprising a cylindrical flywheel means disposed upon the power shaft spaced from the output sprocket and damping means extending between the telescoping member and the support arm whereby said flywheel means increases the vibratory action of the bulldozer blade and a portion of the energy associated with said flywheel means acts against said damping means wherein said damping means includes a supporting means carried on the support arm, a shaft fixedly and threadedly secured thereto, a cylinder disposed upon the telescoping member, a biasing means disposed within



said cylinder, said shaft axially orientated with a bore in said cylinder acting against said biasing means wherein said shaft includes a terminus remote from said supporting means, a cap member having an annular sleeve frictionally disposed upon said shaft and a cap wall formed with said sleeve dimensioned substantially to the inner diameter of said cylinder and adapted to engage said biasing means in which said biasing means comprises a spring disposed within the bore of said cylinder and dimensioned substantially to the inner diameter of said cylinder in which said supporting means comprises an "L" shaped bracket having one leg extending outwardly provided with an aperture through which said shaft passes and another leg tangentially disposed and affixed to the support arm.

4,611,668

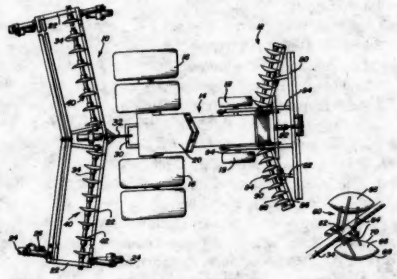
ASSEMBLY FOR FORMING WATER RETAINING POCKETS AND LEVELLING THE GROUND SURFACE

James J. Hrubes, Rte. 1, Box 45, Lindsay, Mont. 59339

Filed Oct. 17, 1984, Ser. No. 662,451

Int. Cl.[4] A01B *35/16*

U.S. Cl. 172—134 **4 Claims**



1. An assembly for forming water retaining pockets in the ground surface comprising a supporting frame, means connecting the frame to a tractor for moving the frame in a path of movement over the ground surface in which pockets are to be formed, a plurality of pocket forming members supported below the frame, means rotatably supporting the pocket forming members for rotation about an axis inclined in relation to the direction of movement of the assembly, each pocket forming member comprising a pair of diametrically opposed, circumferentially spaced blade-like soil cutting and lifting members forming a regular pattern of spaced pockets in the ground, each pocket forming member including sets of support rods extending on diametrically opposite sides of the rotatable member, each with a concave-convex plate spaced from the rotatable member and with an arcuate inner and outer edge supported from each set of rods for engaging and lifting the soil to form a pocket and discharge the soil adjacent the pocket.

4,611,669

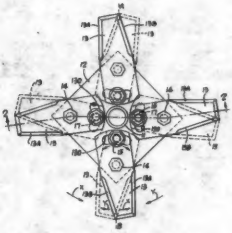
TINE ASSEMBLY

Louis F. Ballard, Medina, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Mar. 29, 1984, Ser. No. 594,343

Int. Cl.[4] A01B *33/14*

U.S. Cl. 172—545 **16 Claims**



14. In a tine assembly for use on a powered rotating shaft of a tiller, the shaft being rotatable in a forward rotating direction and alternately in a rearward rotating direction, comprising in combination a plate mounted on said shaft for rotation with the shaft, said plate being adapted to carry and revolve a plurality of tiller tines connected to the plate at spaced locations around the peripheral extent of the plate, each of said tines having a soil working outer end portion, a pivot connection pivotally connecting said plate and each said tine, respectively, to permit the said soil working end portion of the tine to swing in an arc radially outward of the plate, said pivot connection having an axis, frictional drag means exerting a force substantially parallel to the axis of said pivot connection for preventing unrestrained swinging of the tines about said pivot connection, and limiting means for limiting the extent of the swinging movement of each said tine in its respective arc, said limiting means comprising a pin and an arcuate slot in which the pin is accommodated and movable between the terminal walls of the slot, one of said pin and said slot in which the pin is accommodated being carried by the said plate and the other of said pin and said slot being carried by the respective tine.

4,611,670

MOTOR DRIVEN DRILLING OR CHIPPING DEVICE

Franz Chromy, Levis, Austria, assignor to Hilti Aktiengesellschaft

Filed Jun. 1, 1984, Ser. No. 616,543

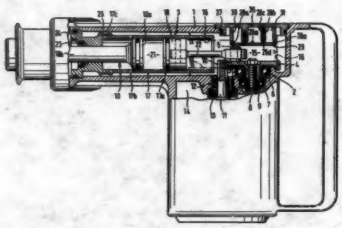
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1983, 3320426

Int. Cl.[4] F21C *3/00*

U.S. Cl. 175—116 **3 Claims**

1. A motor driven drilling or chipping device comprising a housing, a gear arrangement mounted in said housing, an air cushion propulsion mechanism located within said housing and driven by said gear arrangement, said housing including a sealed housing space containing said gear arrangement and said

air cushion propulsion mechanism, said sealed housing space being partly filled with lubricating oil so that in any position of said device an oil level is formed in said sealed housing, an elongated pressure equalizing nozzle projecting through said housing into said housing space, said nozzle forming a passageway having a first end open to the ambient atmosphere outside said housing and an opposite second end open to said housing space whereby the ambient atmosphere has access to said sealed housing space only through said nozzle, and the second end of said nozzle is arranged within said housing space so that the nozzle is not flooded by the lubricating oil in any position of the device, wall means are mounted in said housing and form a stilling chamber, said equalizing nozzle extends into said stilling chamber with said second end of said nozzle open to said stilling chamber, said housing has a front end and a rear end with said air cushion propulsion mechanism arranged to operate a working tool at the front end of said housing, said housing forming a barrel-like portion enclosing said air cushion propulsion mechanism and having an upper surface and a lower surface, said housing forming a motor space projecting downwardly from the lower surface, said motor space located adjacent the rear end of said housing below said housing space,



means for sealing said motor space from said housing space so that the lubricating oil is prevented from flowing from said housing space into said motor space, said housing has an opening in said upper surface thereof adjacent the rear end of said housing and spaced upwardly from said motor space, said wall means forming said stilling chamber located within said opening in said housing and disposed in sealed engagement with said housing, said wall means extending into said housing space and comprising a plate-like member disposed in alignment with the outer surface of said housing, an annular wall extending downwardly from said plate-like member into said housing space, a cover plate secured to said annular wall within said housing space and forming a closure for the lower end of said stilling chamber, said plate-like member, said annular wall and said cover plate defining said stilling chamber, openings located in the lower end of said annular wall at the juncture of said annular wall with said cover plate so that said openings communicate between the interior of said stilling chamber and said housing space, and said nozzle extending through said plate-like member into said stilling chamber whereby said housing space is in communication with the ambient atmosphere through said nozzle and stilling chamber.

4,611,671

VIBRATION INSULATING HANDLE

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

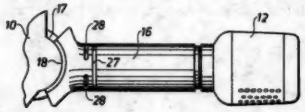
Filed May 7, 1985, Ser. No. 731,528
Claims priority, application Sweden, May 7, 1984, 8402446
Int. Cl.[4] B25G *1/02*; F01N *1/20*
U.S. Cl. 173—162 H **6 Claims**

1. A vibration insulating handle to be mounted on the housing of a portable power tool, comprising:

an inner tube element rigidly attached at one end to a part of the tool housing;

a grip tube element coaxially surrounding said inner tube element and defining together with said inner tube element an annular gap which extends over a substantial part of the axial lengths of said inner and said grip tube elements;

said grip tube element being rigidly attached to a part of the tool housing at one end and being rigidly connected to said inner tube element at an opposite free end, said grip tube element being provided with a number of circumferentially extending through slots in the vicinity of its one end attached to the housing;



wherein said through slots form a weakened portion of said grip tube element to enable elastic yield of said grip tube element in the radial direction relative to said inner tube element in response to bending and shearing vibration forces transmitted from the tool housing, said weakened portion maintaining resistance to torsional loads applied to said grip tube element during operation of the power tool to avoid impairment of handling of the tool.

4,611,672

DRILL BIT

Kurt Hölzl, Leoben, Austria, assignor to Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Jun. 18, 1984, Ser. No. 621,867
Int. Cl.[4] E21B *10/18*
U.S. Cl. 175—339 **13 Claims**

1. A drilling bit for fluid-jet supported rotary drilling in rock, comprising:

a drilling bit body having cutting elements tipped with hard-metal, said cutting elements being fixed with respect to said drilling bit body;

at least one nozzle member releasably installed in said drilling bit body;

said at least one nozzle member having an exit aperture of less than 1 mm diameter;

at least one supply channel for a fluid pressure medium provided in said drilling bit body and opening into said at least one nozzle member;

means for providing a fluid pressure flow having a pressure of between 500 and 4,000 bar;

the drilling bit defining a fluid-jet direction;

a nozzle insert and a retaining body conjointly defining said at least one nozzle member;

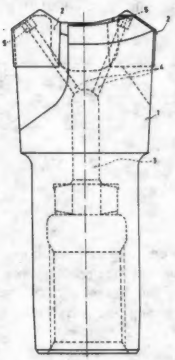
said retaining body extending longitudinally in said fluid-jet direction and comprising a reduced diameter portion providing a substantially cylindrical extension, said cylindrical extension forming a cylindrical guide surface on its outer periphery;

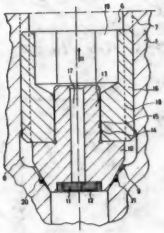
said drilling bit body having a recess;

an annular body releasably retaining said retaining body in said recess of said drilling bit body; and

said annular body comprising a substantially cylindrical recess forming a cylindrical guide surface on said annular body, said cylindrical guide surface on said annular body

cooperating with the cylindrical guide surface on the cylindrical extension of said retaining body whereby said





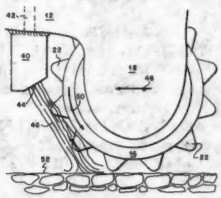
nozzle may be accurately positioned with respect to said cutting elements.

4,611,673

DRILL BIT HAVING OFFSET ROLLER CUTTERS AND IMPROVED NOZZLES

John S. Childers, Greenville; Paul E. Pastusek, and Percy W. Schumacher, Jr., both of Houston, all of Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Continuation-in-part of Ser. No. 133,164, Mar. 24, 1980, abandoned. This application Nov. 21, 1983, Ser. No. 553,937
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] E21B *10/18*
U.S. Cl. 175—340 **14 Claims**



1. A rotary drill bit for drilling a well bore, the bit comprising:

a bit body adapted to be detachably secured to a drill string for rotating the bit and to receive drilling fluid under pressure from the drill string, the bit body having a plurality of spaced apart, depending legs at its lower end, and a plurality of nozzles, one for each of said legs, for exit of the drilling fluid from the bit body; and

a plurality of roller cutters, one for each of said legs, rotatably secured to the legs at the lower end thereof, each roller cutter comprising a generally frusto-conical cutter body and a plurality of powder metallurgy composite cutting elements on the cutter body, the roller cutters being so mounted on the bit body that the apices of the roller cutters are positioned generally toward a central portion of the bit body with the axes of rotation of the roller cutters spaced from the longitudinal centerline of the bit body a relatively large offset distance, whereby some measure of drag motion of the cutting elements across the formation at the bottom of the well bore is imparted thereto which results in enhanced drill bit cutting action, but also an accompanying increased tendency of the cut formation to adhere to the roller cutters in certain formations;

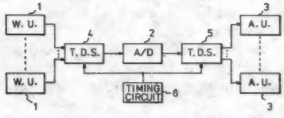
each of said nozzles having passaging therein directing the drilling fluid under pressure to flow downwardly in a stream angled relative to the longitudinal axis of the bit body and generally toward the underside of one of said roller cutters, constituted by the half of said one roller cutter below its axis of rotation, along a line generally adjacent to its cutter body, the drilling fluid impinging at least some of the cutting elements on the roller cutter and thereafter impinging the formation generally at the bottom of the well bore spaced from the points at which the cutting elements of the roller cutter then engage the bottom of the well bore, whereby the formation and the cutting elements impinged by the stream are subjected to separate cleaning actions immediately prior to their engagement for presenting clean engagement surfaces to further enhance the drill bit cutting action.

4,611,674

ANALOG WEIGHING SYSTEM WITH DIGITAL PROCESSING VIA A SINGLE A/D CONVERTER

Motoyuki Adachi, and Toru Kohashi, both of Hyogo, Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Apr. 8, 1985, Ser. No. 720,696
Claims priority, application Japan, Apr. 9, 1984, 59-71559
Int. Cl.[4] G01G *9/00, 3/14, 23/10*
U.S. Cl. 177—1 **7 Claims**



1. A weighing system, comprising a plurality of analog weighing units for weighing product to provide analog weight indicative signals, a plurality of digital measured weight processing units corresponding respectively to said weighing units for processing digitally said weight indicative signals, a common analog-to-digital convertor, a first switch means for coupling said weighing units to said analog-to-digital convertor in response to time division control signals, a second switch means for coupling said analog-to-digital convertor to said weight processing units in response to time division control signals, and means for providing time division control signals to said first and second switch means so that the weight indicative signals of the weighing units are processed by respective digital measured weight processing units.

7. A method of weighing comprising the steps of:

providing a plurality of analog weighing units adapted for producing analog weight indicative signals;

providing a single analog to digital convertor for converting said analog weight indicative signals to digital weight indicative signals;

providing a plurality of processing units, one for each weighing unit, each processing unit being adapted for processing the digital weight indicative signals of its respective weighing unit;

coupling said analog weighing units and said processing units to the analog to digital convertor; and

controlling said coupling so that the weight indicative signals of respective weighing units are processed by corresponding processing units.

4,611,675

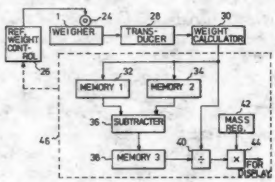
MASS METER

Masami Yamanaka, Miki, Japan, assignor to Yamato Scale Company, Limited, Japan

Filed May 1, 1985, Ser. No. 729,490

Int. Cl.[4] G01G *19/00, 19/22, 3/08*

U.S. Cl. 177—1 **6 Claims**



5. A method of measuring the mass of an article using a force detecting means of the type comprising a pair of cantilever members extending generally parallel to one another generally in the same vertical plane, said cantilever members having fixed inner ends and free outer ends, a force detecting element extending between and connected to the free outer ends of said cantilever members, and means for detecting a force applied to said force detecting element and for producing a signal having a value which varies as a function of the magnitude of the force, said method comprising the steps of:

applying an article to said force detecting means to produce a signal having a first value;

storing said first value;

providing a reference weight of known mass;

applying said reference weight to said force detecting means when said article is applied to the force detecting means to produce a signal having a second value;

storing said second value;

subtracting said stored first value from said stored second value to produce a difference;

dividing said first value by said difference to produce a ratio; and

multiplying the mass of the reference weight by said ratio thereby to produce the mass of the article.

4,611,676

WEIGHBELT APPARATUS

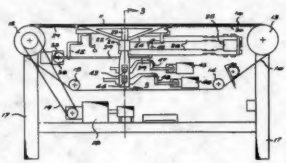
Willem J. Meiring, Stellenbosch, South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland

Filed Jul. 1, 1985, Ser. No. 750,544

Int. Cl.[4] G01G *19/52, 19/00;* **G01L** *25/00*

U.S. Cl. 177—50 **3 Claims**

1. A weighbelt apparatus which has a belt upon which material is moved across the apparatus, a generally planar support for the belt extending across the apparatus, belt lifting means connected to the apparatus and arranged to lift the belt out of contact with the planar support during operation of the apparatus, and means to apply a known downward force to the planar support in order to calibrate the apparatus, with the improvement that the planar support is cantilevered to each side of a central crossbeam transverse to the direction of belt movement, the crossbeam is mounted on a plurality of cantile-



ver arms cantilevered off fixed structure, strain gauges are mounted on the arms and the means to apply the known downward force acts on the lower end of the crossbeam in the vertical plane containing the longitudinal axis of the crossbeam.

4,611,677

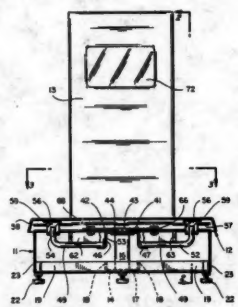
SHOCK PROOF SCALE

George T. Yu, Petaluma, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Filed Mar. 7, 1985, Ser. No. 709,110

Int. Cl.[4] G01G *21/10, 21/12, 3/14*

U.S. Cl. 177—187 **21 Claims**



1. In an electronic weighing scale: a load cell which provides an output signal corresponding to the load applied thereto, a load bridge mounted on the load cell having a plurality of torsion bars through which a load is applied to the load cell, said torsion bars flexing torsionally to protect the load cell from shock loading and overloading, and a load receiving platform mounted on the load bridge and being freely displaceable therefrom to protect the load cell from side loading.

4,611,678

HEAVY DUTY WEIGHING MACHINE HAVING HIGH PRECISION AND RESOLUTION FEATURES

Miguel S. Andriewsky, 5548 Jose Hernandez Street, Munro (1605), Prov. of Buenos Aires, Argentina

Filed Apr. 2, 1985, Ser. No. 718,933

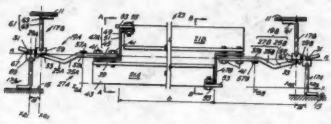
Claims priority, application Argentina, Nov. 7, 1984, 298540

Int. Cl.[4] G01G *3/14;* **G01L** *1/22*

U.S. Cl. 177—211 **10 Claims**

1. A dynamometer machine for detecting the force magnitude of a load applied thereto, and including a pair of longitudinally elongated beam structures that bend under the effect of said load, and means for measuring a parameter related to the bending moments in said beams and deriving said force magni-

tude therefrom; the improvement whereby the actual length of said beam structures are longitudinally extendable, so that the



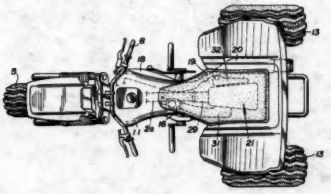
length of each beam structure varies to compensate the bending of said beam structure due to said load.

4,611,679

AIR INTAKE DEVICE FOR MOTOR VEHICLES WITH RIDING SADDLES

Masami Yanagishita, and Yasunori Ogita, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,462
Claims priority, application Japan, Feb. 6, 1984, 59-19670
Int. Cl.⁴ B60K *13/02*
U.S. Cl. 180—68.3 **5 Claims**



1. An air intake device for a motor vehicle with a riding saddle, having a vehicle frame including a head pipe and a main pipe extending rearwardly from said head pipe and having a rear end, an engine mounted on said vehicle frame below said main pipe, an air cleaner disposed behind said engine adjacent to said rear end of said main pipe, a tube defining at least a portion of an air intake passage from said air cleaner to said engine, and an exhaust passage extending rearwardly from said engine in substantially the same horizontal plane and alongside of said air cleaner, the improvement comprising said tube having an end connected to a lateral side of said air cleaner remote from an opposite side thereof along which said exhaust passage extends and said air cleaner has an air inlet on a side thereof facing said rear end of said main tube.

4,611,680

HOOD DOOR ASSEMBLY

Philip D. Redenbarger, Centerpoint, and Franklin R. McCarty, West Terre Haute, both of Ind., assignors to J. I. Case Company, Racine, Wis.

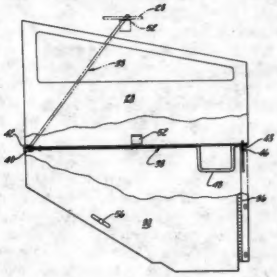
Filed Aug. 30, 1985, Ser. No. 771,453
Int. Cl.⁴ B62D *25/12*
U.S. Cl. 180—69.24 **5 Claims**

1. In a vehicle having a cover for enclosing an engine, the improvement comprising:

a door assembly including a first door and a second door;

means for mounting said first door to said cover for permitting swinging pivotal movement of said first door about a first axis and means for mounting said second door to said cover for permitting swinging pivotal movement of said second door about a second axis, said first axis being generally perpendicular to said second axis, said first and second doors being swingable between closed and open positions, and said doors lying in substantially the same plane in their closed positions with the bottom of said first door being proximate the top of said second door;

rod means for securing said first door in its open and closed positions, one end of said rod means being pivotally attached to said cover and the other end of said rod means engaging a retainer means on said cover when said first



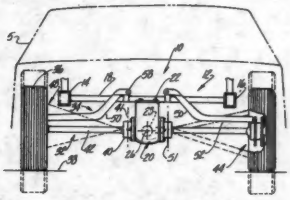
door is in its closed position, said other end of said rod means engaging bracket means on said first door for supporting said first door in its open position, and said rod means engaging said bracket means for holding said first door in its closed position when said other end of said rod means is engaging said retainer means.

4,611,681

INDEPENDENT WHEEL SUSPENSION SYSTEM USING THRUST BEARING CONSTANT VELOCITY UNIVERSAL DRIVE JOINTS AS SUSPENSION MEMBERS

Werner Krude, Grosse Pointe Park, and Daniel W. Hazebrook, Detroit, both of Mich., assignors to GKN Automotive Components Inc., Southfield, Mich.

Filed Mar. 5, 1984, Ser. No. 586,086
Int. Cl.⁴ B60K *20/00*
U.S. Cl. 180—73.4 **12 Claims**



1. An independent wheel suspension system for a vehicle having a chassis supported by chassis support means and power delivery means mounted to said chassis support means, said power delivery means adapted to provide a driving torque to wheel means positioned laterally of said power delivery means and to rotate said wheel means on a driving surface in response to said driving torque, said independent wheel suspension system comprising at least a first and a second suspension member, said first suspension member comprising:

a first and a second coupling, one coupling of said first and second coupling comprising an inboard constant velocity joint, having an inner joint member, an outer joint member, and a cage member located therebetween, said inner joint member, outer joint member, and cage member having partially-spherical surfaces thereon adapted to allow a joint articulation therebetween about a first predetermined axis, said partially-spherical surfaces of said inner joint, outer joint, and cage members adapted to

transmit an axial thrust load therebetween, said inner and outer joint members further having sets of opposed grooves formed therein along a joint axis and distributed angularly thereabout, each said set of opposed grooves engaged by torque-transmitting balls rotatably constrained by said cage member and adapted to move axially along said grooves during said articulation to transmit said driving torque therebetween, one of said inner and outer joint members of said inboard constant velocity joint being respectively connected to one of said power delivery means and said wheel means, said first predetermined axis and said joint axis having an intersection, said intersection establishing a joint center;

drive shaft means connected to the other of said inner and outer joint members of the other coupling of said first and second coupling, whereby said drive shaft means communicates between said first and said second coupling, both said driving torque transmitted by said torque-transmitting balls and also said axial thrust load transmitted between said partially-spherical surfaces of said inner joint, outer joint, and cage members;

said second suspension member comprising a suspension control arm having a wheel end connected to said wheel means and a frame end connected to said chassis support means; and

a swing axis through said frame end and said joint center;

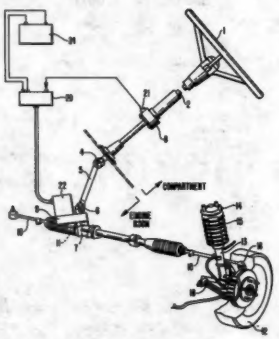
whereby said first and said second suspension members allow said wheel means to swing at said inboard constant velocity joint about said swing axis therethrough.

4,611,682

MOTOR-DRIVEN POWER STEERING SYSTEM

Tomino Yasuda, Kasukabe, and Akio Hashimoto, Kawasaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 8, 1984, Ser. No. 638,669
Claims priority, application Japan, Aug. 8, 1983, 58-144796
Int. Cl.[4] B62D *5/04*; G05D *17/02*
U.S. Cl. 180—79.1 **17 Claims**



1. An electric power steering device for a vehicle, said device comprising:

an electric motor;

actuation means for driving said motor;

coupling means for coupling a steering means to said electric motor;

torque detecting means for detecting the steering torque manually applied to said steering means by a driver and producing a torque signal;

current detecting means for detecting the level of current flow through said electric motor;

current processing means coupled to said current detecting means for providing an output current signal proportional to the square of said level of current flow; and

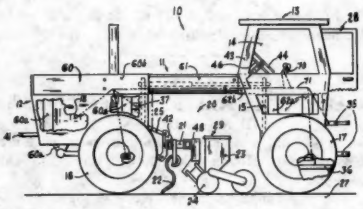
control means for controlling the power of said actuation means in response to said torque signal and said current signal.

4,611,683

FARM TRACTOR

Elwyn P. Hilmer, P.O. Box 185, Yoncalla, Oreg. 97499

Continuation-in-part of Ser. No. 286,241, Jul. 22, 1981, abandoned. This application Nov. 30, 1983, Ser. No. 556,561
Int. Cl.[4] B62D *61/12*; B62K *13/00*
U.S. Cl. 180—209 **22 Claims**



1. An intercropping farm tractor apparatus including connected leading and trailing components comprising:

a leading front section, a trailing rear section, a high center frame for connecting said leading front and trailing rear sections, and means for attaching said high center frame to said leading front section, said trailing rear section;

said leading front section including a front section frame, a low elongated transverse drive axle supported from said front section frame and auto-type steerable wheels mounted on the opposite ends thereof;

an engine supported from said front section frame for driving said wheels;

reversible drive means drivingly connecting said engine to the wheels of said drive axle;

a standard ASAE three point hitch mounted on said front section frame and extending therefrom rearward of said front section frame;

means for operating said standard ASAE three point hitch;

means for steering said wheels;

said trailing rear section including a rear section frame, a low elongated transverse rear section axle supported from said rear section frame having wheels mounted on the opposite ends thereof;

the wheels of said leading front and trailing rear section axles defining substantially the same wheel track width and being disposed in front-to-rear alignment laterally of said apparatus;

said high center frame being spaced above said standard ASAE three point hitch sufficient to allow the latter to lift a three point hitch mounted implement fully above the ground upon which said wheels rest independent of interference between said standard ASAE three point hitch, three point hitch mounted implement and said high center frame;

hitch means mounted on said trailing rear section extending rearwardly of rear section frame; and

an operators station.

4,611,684

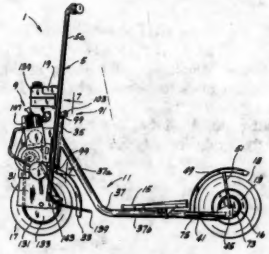
FRONT-WHEEL DRIVE MOTOR VEHICLE

Robert C. Geschwender, Lincoln, Nebr., assignor to George W. Peterson, Lincoln, Nebr., a part interest

Filed Jan. 24, 1985, Ser. No. 694,408
Int. Cl.[4] B62K *15/00*
U.S. Cl. 180—223 **26 Claims**

1. A front-wheel drive motor vehicle comprising a front frame assembly including a front frame extending up at the front of the vehicle, a front wheel mounted at the lower end of the front frame, and steering means at the upper end of the

front frame, a power drive assembly mounted on the front frame for driving the front wheel to power the vehicle, and a rear frame assembly including a rear frame extending rearwardly from the front frame, a rear wheel mounted at the rearward end of the rear frame, a rider's platform on the rear frame forward of the rear wheel at an elevation and position adapted to permit a rider to stand on the platform while grasping said steering means, said platform being mounted for pivoting on the rear frame about a generally horizontal axis extending generally transversely with respect to the rear frame, and a brake for the rear wheel adapted to be actuated by pivoting said platform about said axis in one direction whereby a person standing on the rider's platform may actuate the brake by pivoting one foot without lifting the foot from the platform, the platform being pivotable in the opposite direction to disengage the brake.

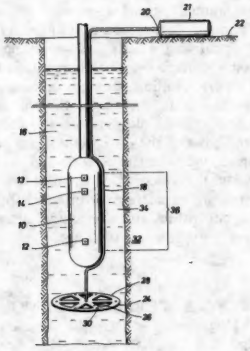


4,611,685

ACOUSTIC LOGGING IN LOW VELOCITY FORMATIONS

John W. Curran, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jun. 7, 1984, Ser. No. 618,029
Int. Cl.[4] G01V *1/40, 1/00*
U.S. Cl. 181—102 **17 Claims**



1. A method for acoustically logging an earth formation surrounding a borehole which contains a liquid, said method comprising the steps of:

generating P-waves having a predetermined frequency at a first location in the borehole in a manner so that the wave will propagate through a zone in said liquid and then penetrate the formation and be refracted in the formation;

contemporaneously introducing gas bubbles into the liquid zone so as to lower the P-waves velocity in the liquid zone to a value less than the P-wave velocity in said formation, wherein the average resonant frequency of said gas bubbles is selected to be greater than said predetermined frequency, and wherein said average resonant frequency is adjusted by varying the average diameter of said bubbles according to the following equation:

$$F_R = 1/\pi D\{3\mu Y Po/\rho\}^{\frac{1}{2}}$$

where

F_R is the average resonant frequency of the bubbles;

D is the average diameter of the bubbles;

Po is the pressure at the bubbles;

ρ is the density of the water gas mixture;

μ is the Polytropic factor; and

Y is the adiabatic constant; and

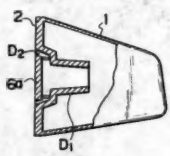
detecting the arrival of the refracted P-waves at at least one receiver spaced vertically from the first location.

4,611,686

SPEAKER SYSTEM

Yoshiaki Kobayashi, and Hiroshi Yoshida, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,151
Claims priority, application Japan, Jun. 25, 1984, 59-129240
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—156 **7 Claims**



1. A speaker system, comprising:

an enclosure having therein at least one speaker;

a duct which is provided within said enclosure, communicates with the interior of said enclosure, and communicates with the exterior of said enclosure through a port provided in a wall of said enclosure; and

a flat, platelike board having a size smaller than the size of said port and positioned in the center of said port so as to extend approximately parallel to an exterior surface portion of said wall in the region of said port, said board cooperating with an inner wall of said duct adjacent said port to define a narrow, circumferential slit which has a uniform width along the entire circumference of said board and which has a smaller total cross-sectional size than the cross-sectional size of said duct in the region of said port;

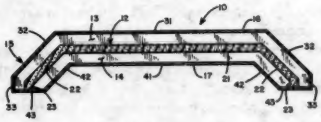
wherein said port is provided in a front baffle which defines a front limit of said enclosure.

4,611,687

THREE-FUNCTION ACOUSTICAL PANEL

Michael T. Nixon, 2810 N. Urbandale La., Plymouth, Minn. 55447

Filed Jul. 23, 1985, Ser. No. 758,120
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—286 **17 Claims**



1. An acoustical panel comprised of:

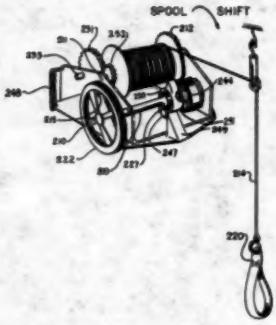
(a) an inner core fabricated of a woven fiberous material having a center section and a plurality of side sections;
(b) an outer shell which is impermeable to moisture and air and which has a back portion and a front portion, said front portion including a center section associated and in general parallel relationship with the center section of the inner core, said front portion further including a plurality of side sections each of which is associated with a different side section of the inner core and generally parallel thereto;
(c) a pocket separating the center and side sections of the inner core from the center and side sections of the front portion of the outer shell.

4,611,688

RE-WINDABLE FIRE ESCAPE

Rajagopalan C. Sekhar, 3 Twilight Dr., Foxboro, Mass. 02035

Filed Jul. 22, 1985, Ser. No. 757,365
Int. Cl.[4] A62B *1/10*
U.S. Cl. 182—237 **6 Claims**



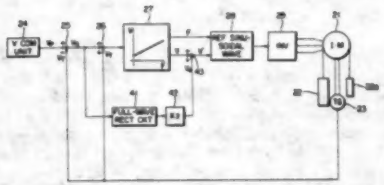
1. A fire escape for lowering a plurality of escapees to the ground, comprising:
(a) a shaft;
(b) a spool journalled upon said shaft;
(c) cable means having a first and second end, said first end secured to the journal of said spool, said cable means having a length generally equal to the distance of said spool above the ground;
(d) body securement means affixed to the second end of said cable means for use by an escapee;
(e) a flywheel rotationally coupled to said spool, said flywheel comprising means for acquiring and storing angular momentum developed therein during the descent of the escapee and of said cable means to the ground; and
(f) means for rotationally transferring said angular momentum from said flywheel back to said spool to thereby effect the rewinding of said cable means so that said body securement means can thusly be used by the next escapee, said rotational transfer means comprising a power train which automatically effects reversal of the spool rotation when the escapee detaches from said cable means at ground level, thereby causing a rewind of the said cable means, in which said power train comprises:
(i) a primary axis and a secondary axis in which most of the said power train and said flywheel are mounted on the primary axis and only the spool is coupled to said power train, said spool mounted on the secondary axis, said primary axis comprising a shaft with said flywheel rotationally mounted thereon;
(ii) a sun gear, planetary gears mounted in rotational mesh, in the same plane with said sun gear;
(iii) cage means, also comprising a brake means, for holding said planetary gears in a fixed radial disposition to said sun gear; and
(iv) ring gear means, integrally located within ring gear housing means, in rotational mesh and in the same plane as said planetary gears, said ring gear means being free to spin on the primary axis independently of said shaft of said primary axis; and said ring gear housing in rotational mesh with said spool mounted on said secondary axis.

4,611,689

VELOCITY CONTROL APPARATUS FOR ELEVATOR

Masayuki Yoshida, Minokamo, and Shota Suzuki, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,421
Claims priority, application Japan, Aug. 19, 1983, 58-151251
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—29 R **10 Claims**



1. In an elevator having an inverter which generates a three-phase alternating current of variable voltage and variable frequency, a velocity command signal generator which produces a velocity command signal for controlling the inverter, and a three-phase induction motor driven by the generated three-phase alternating current from the inverter so as to run a cage,
velocity control apparatus for the elevator comprising:
(a) detection means for detecting a load on said three-phase induction motor and for producing a detection signal;
(b) voltage command signal generation means including means for comparing the detection signal and the velocity command signal and means for supplying the inverter with at least a voltage command signal on the basis of a difference signal resulting from the comparison; and
(c) correction means for adjusting the voltage command signal supplied by said voltage command signal generation means on the basis of the difference signal resulting from the comparison between the detection signal of said detection means and the velocity signal so as to deliver a voltage command signal corrected for variations in load for varying and controlling the alternating current generated by the inverter for running the cage.

4,611,690

BICYCLE WHEEL RIM BRAKE

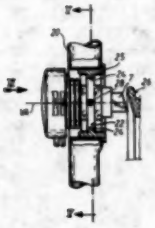
Robert Schoch, Hilzingen, Fed. Rep. of Germany, assignor to Weinmann GmbH & Co., KG, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,898
Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317770
Int. Cl.[4] B62L *3/02*
U.S. Cl. 188—24.11 **8 Claims**

1. In a brake adapted for use with a bicycle wheel rim lying adjacent a bicycle frame and having:
(a) a bearing housing;
(b) a sliding member supported by said housing for linear reciprocating movements relative to said housing toward and away from said rim along an axis of displacement at right angles to the rim;

(c) a brake lining carried by said sliding member at that end of the latter confronting said rim and extending beyond said housing for engagement with said rim;

(d) a rotary actuating element carried by said housing and rotatable against the force of a spring about an axis substantially coincident with the axis of displacement of the sliding member, said actuating element being in threaded engagement with the sliding member; and



(e) said bicycle frame having a recess therein adjacent said rim;

(f) the improvement wherein said bearing housing is rotatably accommodated in said recess for rotary movements about said axis of displacement, said housing and said frame having cooperable bayonet catch parts for removably retaining said housing in said recess.

4,611,691

HYDRAULIC ACTUATOR ASSEMBLIES FOR VEHICLE BRAKES

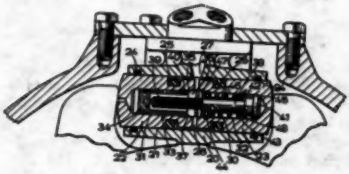
Graham J. Gornall, West Midlands, England, assignor to Lucas Industries Public Limited Company, United Kingdom

Filed Oct. 18, 1984, Ser. No. 662,374

Claims priority, application United Kingdom, Oct. 19, 1983, 8327967; Mar. 7, 1984, 8405902

Int. Cl.[4] F16D 55/02

U.S. Cl. 188—71.8 **11 Claims**



1. A hydraulic actuator assembly comprising a housing having a bore, a piston working in said bore and movable between a retracted position and an advanced brake-applying position, means for applying hydraulic brake-applying pressure to said piston in said bore to generate a brake-applying force, an adjuster assembly for determining said retracted position of said piston and braking clearances, and a strut through which said adjuster assembly acts on said piston, wherein said adjuster assembly comprises a first clamp member movable with said piston, an adjuster member, a first part on said first clamp member, and a second part on said adjuster member, said first and second parts being movable into engagement with each other to form a releasable detent, a resilient means acting between said piston and said clamp member normally to bias said first part and said second part into said engagement, a first inclined face on said piston, a second inclined face on said clamp member complementary to said first inclined face and engageable therewith, said inclined faces being so constructed and arranged that axial movement of said clamp member with respect to said piston in an outward brake-applying direction in response to said hydraulic brake-applying pressure in said bore enhances said engagement of first and second parts, a stop provided in said bore and with which said adjuster member is adapted to co-operate when movement of said adjuster member in a brake-applying direction exceeds a distance sufficient to take up said braking clearances, and a spring loading said stop, additional movement of said clamp member in the said brake-applying direction causing said clamp member to move axially with respect to said adjuster member to increase the effective length of said strut and define an adjusted retracted position for said piston with said detent released against said bias of said resilient means until the said force of said engagement of said interengaging parts at a predetermined point exceeds the force of said spring-loaded stop, whereby to reengage said detent and prevent further relative axial movement between said adjuster member and said clamp member whereafter further movement of said strut with said piston is accommodated by movement of said stop against said loading in said spring, said adjusted retracted position defining a position to which said piston can retract when said brake pressure is relieved and which determines said braking clearances, no relative movement between said clamp member and said adjuster member taking place when said brake pressure is so relieved.

4,611,692

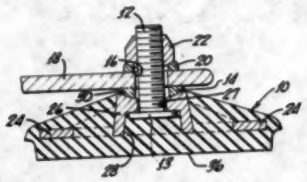
BICYCLE BRAKE ASSEMBLY

Richard C. Everett, P.O. Box 1304, Lake Grove, Oreg. 97034

Filed Dec. 6, 1984, Ser. No. 678,966

Int. Cl.[4] F16D 65/00

U.S. Cl. 188—73.1 **9 Claims**



1. In a bicycle brake assembly for attachment to a caliper brake arm of a bicycle, the combination comprising:

a brake shoe member including a backbone member formed of a metallic material in a generally elongate, generally rectangular framework having openings therein and edge portions defining a common plane, said backbone member having a reinforced portion generally intermediate the ends of said backbone member on the side opposite said common plane with a concave surface from which protrudes a stud member having a shaft thereof extending from the backbone member;

friction material molded about and substantially surrounding said backbone member and extending through said openings with said concave surface exposed and with a friction brake shoe surface generally parallel to said common plane; and

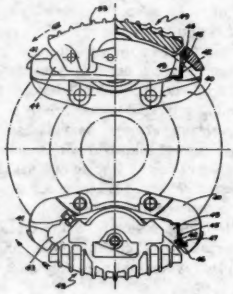
washer means for mounting on said shaft having a convex surface for matingly coacting with said concave surface of said backbone member for enabling adjustment of said brake shoe member relative to the caliper arm of the brake assembly with said shaft passed through an opening in the brake arm.

4,611,693

CALIPER DISC BRAKE

Nui Wang, Sydney, Australia, assignor to Girlock Limited, Belmore, Australia

Filed Dec. 9, 1983, Ser. No. 559,649
Claims priority, application Australia, Dec. 23, 1982, PF7404
Int. Cl.[4] F16D 65/09
U.S. Cl. 188—73.34 6 Claims



1. A sliding caliper disc brake engageable with a disc rotatably mounted on a vehicle comprising:

an anchor bracket adapted to be mounted in a fixed relation on a motor vehicle;

a pair of relatively spaced slideways on said anchor bracket arranged facing each other and substantially parallel to the axis of the disc with which the brake is to be used;

inboard and outboard friction pads having planar faces adapted to be brought into frictional contact with opposite faces of the disc;

an inboard and an outboard backing plate attached in supporting relation to a respective friction pad, each backing plate having end portions each terminating in an abutment portion slidable in one of said slideways;

a caliper housing having an inboard and an outboard portion on opposite sides of the disc;

a cylinder in said inboard portion;

a piston slidably mounted in said cylinder;

an aperture in said piston opening through the end of the piston adjacent said inboard backing plate;

a stepped projection on the surface of said inboard backing plate adjacent to said piston and projecting toward said piston having a first portion adjacent said surface and a second reduced size portion projecting from said first portion;

connecting means for connecting said inboard backing plate to said piston comprising,

a spring clip means having a central portion and an outer peripheral portion closely fitting in engaging relationship within said aperture to attach said clip to said piston,

a hole in said central portion having a larger diameter than the outer dimension of said first portion of said projection to provide clearance between said hole and said first portion for permitting limited relative movement between said inboard backing plate and said piston in a direction parallel to the plane of the face of said inboard friction pad, and

means to retain said clip on said inboard backing plate in the direction of movement of said piston; and

attachment means on said outboard portion for attaching said outboard backing plate to said housing;

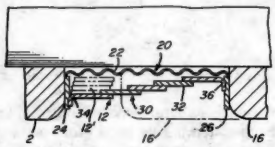
so that said housing is supported solely on said backing plates and on operation of the brake actuating said piston to apply said friction pads on opposite sides of the disc, sliding motion of said backing plates is guided solely by said slideways on said anchor plate, and said inboard backing plate is positively attached to said piston against movement in the direction of movement of said piston to provide a spring-loaded friction slip joint, the spring loading generating sufficient friction against relative movement between said piston and said inboard backing plate to support a portion of said housing load while allowing sufficient movement of said housing with respect to said backing plate to allow said caliper housing to move to and remain in a position in which it is in correct alignment with the disc.

4,611,694

MOUNTING PIN SEALS FOR DISC BRAKE CALIPERS

Russell L. Hickson, Rochester Hills, and James L. Weber, West Bloomfield, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1985, Ser. No. 698,287
Int. Cl.[4] F16D 65/02
U.S. Cl. 188—73.45 13 Claims



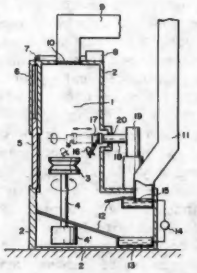
1. Disc brake caliper apparatus having mounting pins connected to a spider and extending in an axial direction for mounting the brake elements, the mounting pins having seals in which the improvement comprises a first inner seal adjacent the mounting pin and a second outer seal surrounding the inner seal, the outer seal comprising a flat helical spring having convolutions with flat outer and inner surfaces, a portion of the outer surface adjacent one edge of each convolution contacting a portion of the inner surface adjacent the opposite edge of each next outward convolution whereby as the brake apparatus slides on the mounting pin the convolutions slide in contact with the next adjacent convolutions to prevent ingress of foreign materials.

4,611,695

AUTOMATIC PAINTING SYSTEM

Yoshito Kato; Shuichi Sunahara; Takayuki Tanaka, and Hiroshi Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 628,287, Jul. 6, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 771,152
Claims priority, application Japan, Jul. 6, 1983, 58-105071[U]
Int. Cl.[4] B05B 15/12
U.S. Cl. 118—323 7 Claims



1. An automatic painting system, comprising:

a sealed painting booth composed of a partition having a door for transferring a workpiece to be painted into and out of the painting booth, an air inlet port for supplying air to said painting booth and an air outlet port to discharge paint mist out of the painting booth;

an electrically-operated automatic painting robot and which comprises an arm having a spray gun, an arm housing accommodating said arm therein and extending through said partition, means for hermetically sealing said arm housing with respect to said partition from outside atmosphere, a control unit connected to said arm and disposed outside of said painting booth, and means for sealing said arm within said arm housing so as to allow for axial movement of said arm within said arm housing; and

means for extending said arm within said arm housing towards and away from said control unit for movement of said spray gun within said painting booth wherein said means for extending said arm within said arm housing further comprises an explosion-proof boot extending between said arm housing and said arm in a hermetically sealed relation.

4,611,696

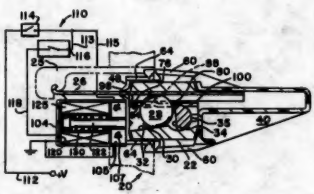
BRAKE CONTROL DEVICE

William K. Messersmith, and Lloyd G. Bach, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 24, 1985, Ser. No. 726,838

Int. Cl.[4] B60K *41/24*

U.S. Cl. 192—13 A **12 Claims**



1. An improved brake control device wherein the vehicle includes a brake pedal and a clutch pedal, the brake control device comprising a housing fixedly disposed relative to the vehicle and defining an opening therein, a connecting member carried within the opening and operatively coupled to the brake pedal, a linkage assembly extending into the opening and operatively coupled to the clutch pedal, locking means at least partially carried within the opening to automatically lock the connecting member to the housing when the clutch pedal is depressed and the vehicle is disposed on an incline, said locking means comprising a ball and an inclined ramp upon which the ball is disposed, and electromagnetic means for selectively preventing said locking means from automatically locking the connecting member to the housing, characterized in that said locking means further includes actuator means coupled to control circuit means for energizing said actuator means which displaces said ball into engagement with the connecting member and housing when the clutch pedal is depressed and the vehicle disposed on a predetermined incline.

4,611,697

ELECTROMAGNETIC POWDER COUPLING WITH COOLING FINS

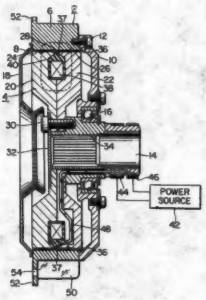
Ryosuke Okita, Aioi, and Kiyohide Okamoto, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,977

Claims priority, application Japan, Jul. 5, 1982, 57-102623; Jul. 5, 1982, 57-102624; Jul. 5, 1982, 57-102626; Aug. 20, 1982, 57-126516

Int. Cl.[4] F16D *37/02, 13/72*

U.S. Cl. 192—21.5 **2 Claims**



1. An electromagnetic powder coupling comprising an outer rotary driving member connectable to an external driving element and an inner rotary driven member connectable to an external element to be driven,

said inner driven member comprising a hub having means for connecting said hub to an external element to be driven, two rim elements mounted coaxially on said hub and having cylindrical outwardly facing pole faces, a toroidal coil disposed in an annular cavity between said rim elements and means for supplying electric current to said coil, and

said outer driving member comprising a cold forged cylindrical member having on its inner side a cylindrical inwardly facing pole face spaced radially from said pole faces of said inner member and having on its outer side a multiplicity of circumferentially spaced, axially extending radially projecting integral cooling fins, said cylindrical member having in a first axial end face a plurality of circumferentially spaced tapped holes, said holes being disposed at the bases of circumferentially spaced fins, a disc-shaped support bracket rotatably mounted on said hub and extending radially to said first axial end face of said cylindrical member, screws extending through holes in said support bracket and screwed into said tapped holes in said cylindrical member to secure said cylindrical member to said support bracket, said cylindrical member having at a second axial end opposite said first axial end a planar radially projecting mounting flange integral with said cylindrical member and said fins, said mounting flange extending radially outwardly beyond said fins and having a wavy outer peripheral edge with troughs of waves coinciding with said fins and crests of waves disposed between said fins to provide wider portions of said flange between said fins, said flange having a plurality of circumferentially spaced mounting holes for reception of elements for connecting said cylindrical member to a driving element, said mounting holes being disposed in wider portions of said flange between fins,

magnetic particles in the space between the pole face of said outer member and pole faces of said inner member, and,

a cover plate secured to said second axial end of said cylindrical member.

4,611,698

SWITCH MECHANISM FOR SEQUENTIAL ACTION OF A DOUBLE CLUTCH MECHANISM

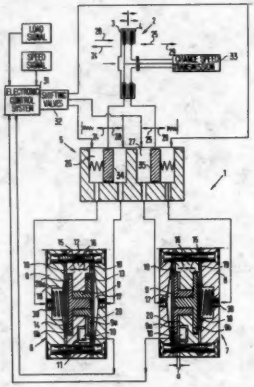
Ulrich Lehmann, Weissach, Fed. Rep. of Germany, assignor to Dr.Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 546,179

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239927

Int. Cl.⁴ F16D *25/11*; G01L *9/10*

U.S. Cl. 192—30 W **16 Claims**



1. An installation for controlling a sequential actuation for a hydraulically actuated double clutch having two clutch means of a motor vehicle change-speed transmission, characterized in that a differential pressure switch means is provided for the installation to be utilized in the sequential actuating of the clutch means of the double clutch for the engagement of a speed coordinated to the respective clutch means, said differential pressure switch means including a shifting piston means moveable in two directions, having plural end face portion means acted upon by the control pressure of the clutch means and being limited in its shifting in both directions by stop portions of a piston housing means surrounding the piston means between two end portions, said stop portions being located between the two end portions, said shifting piston means being operable at one of its two end positions to influence a measuring element of a signalling means in dependence on an end position of the respective clutch means.

4,611,699

CONTROL VALVE FOR A HYDRAULIC CLUTCH

Fukunaga Takao, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

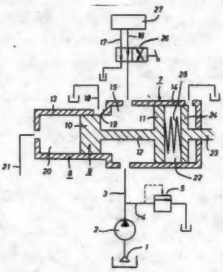
Filed Aug. 10, 1984, Ser. No. 639,396

Claims priority, application Japan, Aug. 10, 1983, 58-124981[U]

Int. Cl.⁴ B60K *41/02*

U.S. Cl. 192--0.076 **4 Claims**

1. A control valve for a hydraulic clutch system comprising a cylindrical valve body; a first piston slidably fitted into the valve body; a second piston slidably fitted into the valve body; a rod connecting both pistons together; a control chamber formed between both pistons and around the rod; an inlet connecting the chamber to a supply passage connected to a hydraulic source; an outlet connecting the chamber to a supply connected to a hydraulic clutch; a leak port connecting the chamber to a drain passage; a first forcing means operable to force the first piston toward the second piston by a force according to the rotation speed of an engine; and a second forcing means operable to force the second piston toward the first piston by a force according to the opening degree of the throttle, said leak port and the first piston being relatively so positioned that an opening degree of the leak port decreases when the first piston moves toward the second piston wherein



said second piston has a larger diameter than the first piston so that the difference of the pressure forces applied to both pistons by the pressurized oil in the control chamber forces the first piston to close the leak port.

4,611,700

CLUTCH RELEASE BEARING AND CORRESPONDING CLUTCH RELEASE YOKE

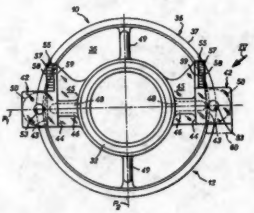
Dominique Després, Clichy, France, assignor to Valeo, Paris, France

Filed Aug. 20, 1984, Ser. No. 641,998

Claims priority, application France, Aug. 23, 1983, 83 13587

Int. Cl.⁴ F16D *23/14*

U.S. Cl. 192—98 **10 Claims**



1. Clutch release bearing suitable for automotive vehicles, said clutch release bearing comprising a drive member adapted to operate on a clutch release device of a clutch, a maneuvering member axially coupled to said drive member and comprising two radial arms adapted to be operated on by a control member in diametrally opposite positions and on respective opposite sides of an engagement plane, said arms being spaced from the extending axially towards said drive member, a respective first axial surface associated orthogonally with each of said arms forming means for guiding a control member and to prevent said clutch release bearing from rotating on such control member, a respective plate associated with each of said arms on said maneuvering member, said plates being on the same side of a traction plate, perpendicular to said engagement plane and passing through median parts of said arms, a respective second axial surface on each of said plates, and a chamfer on an edge of each of said plates perpendicular to said traction plane and nearest the associated radial arm.

4,611,701
TORSION DAMPING ASSEMBLY FOR USE IN MOTOR VEHICLES

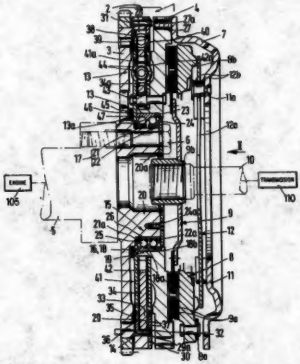
Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,498

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408069; Jun. 12, 1984, 3421698

Int. Cl.[4] F16D *13/70*

U.S. Cl. 192—110 B **24 Claims**



1. A damping assembly, particularly for taking up and compensating for fluctuations in the transmission of torque between the internal combustion engine and the change-speed transmission of a motor vehicle, comprising a plurality of coaxial flywheels which are rotable within limits relative to each other and include a first flywheel arranged to receive torque from the engine and a second flywheel arranged to transmit torque to the transmission; damper means arranged to yieldably oppose rotation of said first and second flywheels relative to each other; and a bearing device interposed between said first and second flywheels and including at least one self-adjusting antifriction bearing.

4,611,702
CLUTCH COVER

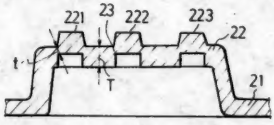
Nobuhiro Kayakabe, and Isamu Sasaki, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 20, 1984, Ser. No. 642,163

Claims priority, application Japan, Aug. 19, 1983, 58-129131[U]

Int. Cl.[4] F16D *13/75*

U.S. Cl. 192—110 R **12 Claims**



1. A clutch cover to be secured to a flywheel of a vehicle engine and to be assembled with at least one pressure plate, comprising:

a plurality of press-formed balance adjusting portions provided at a peripheral portion of the clutch cover, each of said balance adjusting portions being connected to a main body of said clutch cover via a thin walled neck portion having a thickness less than that of said cover.

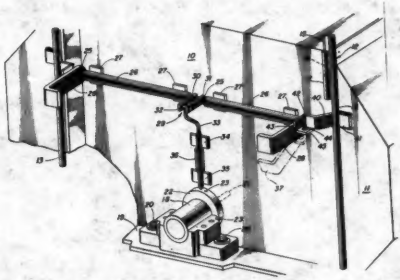
4,611,703
SAFETY LOCK FOR ROTATING MACHINERY

William L. Bliss, P.O. Box 246, Newkirk, Okla. 74647

Filed Sep. 3, 1982, Ser. No. 414,798

Int. Cl.[4] F16H *27/02, 31/00;* **E05C** *3/04*

U.S. Cl. 192—135 **3 Claims**



1. Means for securing access to an enclosure confining rotating machinery said enclosure having at least one door attached by hinges to said enclosure, means for securing said door against accidental opening while said machinery is rotating comprising:

(a) shaft means coupled to said rotating machinery and extending out of said enclosure means;

(b) disc means attached axially to said shaft means and having an opening means extending radially into its periphery;

(c) rod means pivotally attached to said enclosure and having means attached to said rod means for entering said peripheral opening means when said shaft rotating is stopped, whereby said rod means will pivot when said means is inserted into said opening means;

(d) lever means attached to said rod means for pivoting said rod means;

(e) a stop means attached between said door and said rod means to prevent rotation of said door toward said rod means when said rod means is in an un-pivoted position;

(f) a lock means attached between said door and said rod means to prevent rotating said door away from said rod means when said rod means is in an un-pivoted position,

whereby, when said rotating machine is stopped and an opening means is positioned to permit said means to enter said opening means, then said lever means can be operated to pivot said rod means causing said means to enter said opening means and moving said stop means and said locking means out of engagement with said corresponding door stop and locking means thereby permitting said door to rotate in either direction.

4,611,704
VIBRATORY FEEDING WORK STATION MODULE AND SYSTEM

Warren C. Burgess, Jr., 3685 E. Lake Rd., Sheffield Lake, Ohio 44054

Continuation-in-part of Ser. No. 310,083, Oct. 9, 1981, Pat. No. 4,444,303. This application Feb. 21, 1984, Ser. No. 581,581

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—345 **1 Claim**

1. A system for conveying the workpieces comprising:

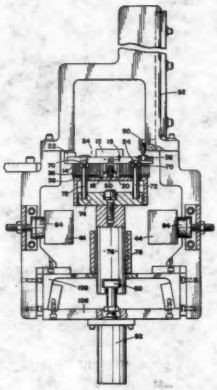
a plurality of workpiece carriers for carrying workpieces, each workpiece carrier having at least one nest means for receiving and holding a workpiece;

a conveying surface along which the workpiece carriers are moved, the conveying surface including a multiplicity of

resilient fibers projecting outward therefrom to engage the workpiece carriers;

vibrating means for vibrating the conveying surface, such that the carriers move therealong;

at least one directing rail mounted on the conveying surface adjacent the resilient fibers and a rail receiving slot defining means on the carrier for receiving the conveying surface directing rail therebetween, each carrier being supported by the fibers and being disposed in a non-supported association with the directing rail, the directing rail terminating in an upper surface disposed below upper ends of the fibers such that the carrier is supported by the



fibers rather than the directing rail and is disposed generally centrally along the conveying surface with the fibers spaced a short distance therefrom and wherein the slot defining means includes a plurality of pins extending downward from the carrier fiber engaging of pins extending downward from the carrier fiber engaging surface into the space defined between the fibers and the guide rail; and,

an alignment means for aligning the carriers in a predetermined relationship with a work station whereby a preselected operation can be performed automatically on the carrier workpiece.

4,611,705

APPARATUS FOR SEPARATING ARTICLE GROUPS OF PREDETERMINED LENGTH FROM A CONTINUOUSLY ADVANCED ARTICLE STACK

René Fluck, Schleitheim, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 30, 1985, Ser. No. 761,379

Claims priority, application Switzerland, Jul. 31, 1984, 3704/84

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—425 **7 Claims**

1. An apparatus for separating article groups of predetermined length from an article stack of indefinite length, comprising:

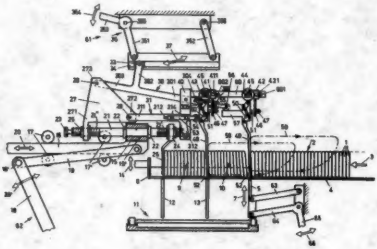
(a) first conveyor means for advancing the article stack in a conveying direction;

(b) a pickup element arranged for a back-and-forth displacement parallel to said conveying direction and for being periodically abutted by a momentarily leading article of said stack;

(c) first driving means for imparting said back-and-forth motion to said pickup element;

(d) a separating assembly situated upstream of said pickup element and including at least two separating elements spaced from one another parallel to said conveying direction and being displaceable as a unit;

(e) second driving means for moving said separating elements towards said first conveyor means generally perpendicularly to said conveying direction to introduce said separating elements into the article stack for forming a first article group between said two separating elements and a second article group between said pickup element and the separating element adjacent said pickup element and for moving said separating elements in synchronism with said pickup element, in said conveying direction away from said first conveyor means;



(f) a transfer tray situated immediately downstream of said first conveyor means as viewed in said conveying direction and arranged for receiving said article groups moved by said separating elements during their displacement in said conveying direction;

(g) second conveyor means situated adjacent said transfer-tray;

(h) means for effecting transfer of said article groups simultaneously from said transfer tray to said second conveyor means; and

(i) means situated between said transfer tray and said second conveyor means for maintaining said groups separated from one another during their transfer from said transfer tray to said second conveyor means.

4,611,706

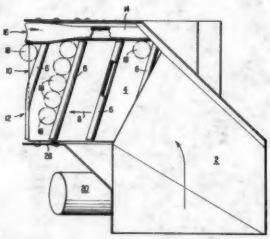
METHOD AND APPARATUS FOR PACKING FRUIT

Gary O. Niemann, 3204 E. Lake Hartridge Dr., NW., Winter Haven, Fla. 33880

Filed Aug. 10, 1984, Ser. No. 639,820

Int. Cl.[4] B65G *47/12*

U.S. Cl. 198—443 **8 Claims**



1. Apparatus for delivering a plurality of objects sequentially comprising:

conveyor means for carrying said objects, said conveyor means comprising belt means for providing a moving surface in a first direction and oriented at an angle with

respect to the horizontal, said belt means comprising a continuous, flexible belt,

discharge means at an upper end of said conveyor means which is higher than any adjacent portion of said belt means,

a plurality of cleat means for engaging said objects and for receiving a plurality of said objects side-by-side along each individual one of said cleat means, said plurality of cleat means being attached to an outer surface of said belt means for movement therewith and each individual cleat means being at a non-zero angle to said upper end of said conveyor means, and bumper means attached to an edge of said belt means adjacent the lower ends of said plurality of cleat means for preventing movement of said objects beyond said edge, whereby said objects are discharged in sequence over said upper end of said conveyor means.

4,611,707

DEVICE FOR TRANSFERRING A BALL FROM A WINDING MANDREL TO A CARRIER MEMBER ARRANGED ON A CONVEYOR BELT

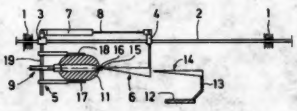
Klaus Wedler, Mittelbiberach, Fed. Rep. of Germany, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG, Mengen, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,541

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406636

Int. Cl.⁴ B65G *25/04*

U.S. Cl. 198—468.2 **4 Claims**



1. A device for transferring a ball from a winding mandrel to a carrier means arranged on a conveyor belt comprising:

a gripping means displaceable between the winding mandrel and the carrier means, said gripping means withdrawing the ball from the winding mandrel and conveying it to the carrier means;

the carrier means having a cantilevered carrier arm attached to the conveyor belt, said carrier arm fitting into a center hole of the ball;

a wedge means adapted to be positioned with its tapering end at the free end of the winding mandrel upon commencement of the ball withdrawal procedure;

the gripping means being displaceable relative to the wedge means and pushing the ball from the winding mandrel onto the wedge means;

means for moving said wedge means towards the carrier arm together with the gripping means and the ball;

the cross sectional profiles of the wedge means and the carrier arm being such that the wedge means is displaceable lengthwise of the carrier arm so as to pass over said arm; and

means for displacing the wedge means beyond the carrier arm when the gripping means is stationary so that the ball is pushed onto and remains on the carrier arm.

4,611,708

RECIPROCATING CHANNEL FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Dec. 10, 1984, Ser. No. 680,070

Int. Cl.⁴ B65G *25/04, 37/00*

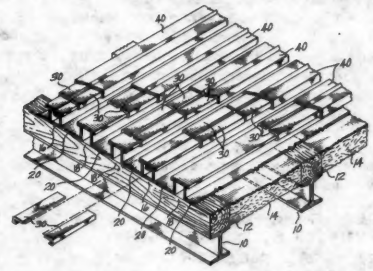
U.S. Cl. 198—750 **35 Claims**

1. A reciprocating floor conveyor, comprising:

a plurality of laterally spaced apart support beams, each having opposite side walls and a top, and said top including a pair of oppositely extending flanges, each flange projecting laterally outwardly beyond the side wall on a side of the support beam;

slide bearing means on said support beams, said slide bearing means including, on each side of each support beam, a top part situated above the support beam, a lower flange part located below the flange on its side of the support beam, and a web interconnecting the top part and lower flange part;

a separate floor member associated with each said support beam, each floor member comprising a top, a pair of side walls depending from opposite side edges of the top, and



flange means projecting inwardly from the side walls, towards the side walls of the support beams,

wherein on each side of each support beam the top of the floor member rests on the top part of the bearing, the web of the bearing is inwardly contiguous to the side wall of the floor member, and the flange means on the floor member is located below the lower flange part of the bearing;

fixed bottom wall means located between the support beams; and

an open space defined by and between the adjacent side walls of each adjoining pair of floor members.

4,611,709

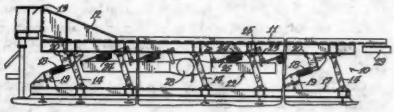
VIBRATORY CONVEYOR

Richard B. Kraus, and Albert Musschoot, both of Barrington, Ill., assignors to General Kinematics, Barrington, Ill.

Division of Ser. No. 401,736, Jul. 26, 1982, Pat. No. 4,428,476, which is a continuation of Ser. No. 175,883, Aug. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 53,855, Jul. 2, 1979, abandoned. This application Sep. 12, 1983, Ser. No. 531,036

Int. Cl.⁴ B65G *27/08*

U.S. Cl. 198—764 **3 Claims**



1. A vibratory conveyor comprising an elongated material-carrying member, a base, a plurality of legs for pivotally supporting the material-carrying member of the base for generally horizontal reciprocating movement, a plurality of isolation springs for isolating the material-carrying member from the base, each isolation spring having one end connected to the material-carrying member and the other end connected to the base, an exciter member, said exciter member being elongated in the direction of elongation of the material-carrying member, means suspending the exciter member from the material-carrying member so that substantially the entire weight of the ex-

citer member is carried by the material-carrying member with the vibratory conveyor in a static state so as to minimize the vertical vibrational forces on the base during operation of the vibratory conveyor, said suspending means comprising a plurality of arms connecting between the exciter member and the material-carrying member, and a plurality of force transmitting springs, each of said force transmitting springs having one end secured to the material-carrying member and the other end secured to the exciter member, each force transmitting spring extending upwardly from the exciter member to the material-carrying member along an axis substantially perpendicular to the arms, vibration generating means mounted either on the exicter member or on the material-carrying member for vibrating the exciter member at a rate and magnitude to produce vertical acceleration on material carried by the material-carrying member less than the acceleration of gravity and means for driving said vibration generating means.

4,611,710

HINGE-TYPE TABLE TOP CHAIN

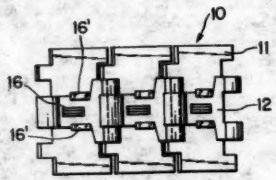
Takashi Mitsufuji, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Jan. 12, 1984, Ser. No. 570,139

Claims priority, application Japan, Jan. 14, 1983, 58-2715[U]; May 19, 1983, 58-73774[U]

Int. Cl.⁴ B65G *47/84*

U.S. Cl. 198—803.01 **1 Claim**



1. In a hinge-type table top chain having a plurality of substantially identical links hingedly interconnected in series to define an endless loop, the improvement wherein said link comprises:

a one-piece metal link plate formed from a platelike metal blank, said link plate having a central part and first and second hinge parts integral with said central part on opposite ends thereof for permitting adjacent link plates to be hingedly connected in series, said central part comprising a substantially planar platelike portion which extends substantially tangentially between said first and second hinge parts, each of said hinge parts being integrally joined to a said end of said central part and wound sidewardly relative thereto to form at least a partial annular portion which defines said hinge part, said planar platelike portion having opposite side edges defining said control part,

said central part having first engaging means associated therewith, said first engaging means comprising a first central opening which extends transversely through said platelike portion and a pair of second openings which are positioned on opposite sides of said first opening and extend transversely through said platelike portion, said second openings comprising elongated slots which extend longitudinally along and open directly inwardly from a respective one of said side edges; and

a one-piece top plate of a plastics material fixedly but removably attached to said link plate so as to overlie the latter and define an enlarged upper and substantially planar support surface which overlies and extends substantially parallel with said central part, said top plate having second engaging means integral therewith for engagement with said first engaging means for stationarily and fixedly connecting said top and link plates together;

said second engaging means including a first pair of hooklike legs which project transversely from the underside of said top plate and are resiliently deflectable for insertion through said first opening and for creating a snap-type engagement with the underside of said platelike portion, said second engaging means also including a second pair of hooklike legs which are disposed sidewardly on opposite sides of said first pair and which project transversely from the underside of said top plate so that each of said second hooklike legs projects through one of said second openings for creating a snap-type engagement with the underside of said platelike portion, the hooklike legs of each said pair being oppositely sidewardly directed.

4,611,711

CASH BOX

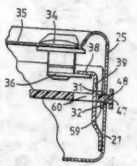
Clive W. Warwicker, Cookley, Nr. Kidderminster, United Kingdom, assignor to Helix Limited, West Midlands, England

Filed Sep. 12, 1985, Ser. No. 775,157

Claims priority, application United Kingdom, Mar. 12, 1985, 8506405

Int. Cl.⁴ A45C *11/28*

U.S. Cl. 206—0.81 **14 Claims**



1. A cash box comprising:

a lid part having a panel portion and a continuous peripheral wall connected thereto;

a bottom receptacle part having a base portion and a continuous peripheral wall, with said lid part and said bottom receptacle part forming complementary hollow parts of said cash box; said bottom receptacle part also having a lock abutment means;

hinge means hingedly interconnecting said lid part and said bottom receptacle to permit relative movement thereof between a closed and an open position;

a carrying handle mounted on said panel portion of said lid part;

a locking mechanism for locking said cash box in said closed position; said locking mechanism includes a lock unit mounted to said panel portion of said lid part, and a locking member operatively connected to said lock unit and movable relative thereto for selectively engaging and disengaging said lock abutment means of said bottom receptacle part, thereby providing for locking and unlocking of said cash box;

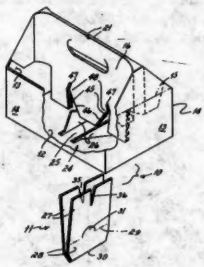
a coin tray which is positioned within said cash box, and which has cooperating peripheral walls and partition walls providing a plurality of open-topped coin-receiving compartments; and

edge support means provided on said bottom receptacle part to support said coin tray in such a way that said coin receiving compartments thereof are accommodated at least partially within said lid part when said cash box is in said closed position.

4,611,712
APPARATUS FOR ERECTING A BOTTLE CARRIER

Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Division of Ser. No. 473,012, Mar. 7, 1983, Pat. No. 4,512,755.
This application Nov. 23, 1984, Ser. No. 674,235
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.[4] B65D 77/00
U.S. Cl. 206—198 3 Claims



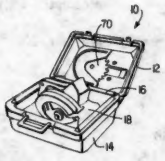
1. In a bottle carrier having a bottom wall, side walls, end walls and a central partition, a divider structure to create six cells within said carrier, said divider structure comprising,
a central opening in said bottom wall,
a pair of upwardly-extending longitudinally-spaced slots in the lower end of said central partition,
each said slot terminating in an inwardly-extending section to create a bulge in the slot edge,
and an initially V-shaped divider having a pair of legs which are split in their upper edges to enable them to straddle said central divider,
said legs being transversely creased to create a U-shaped divider after insertion into said carrier,
whereby said divider is introduced as a V and as the surfaces of said legs ride over said bulges, the divider will snap into a channel-shaped divider folded along the creases in said divider legs.

3. A carrier as in claim 1 further comprising a semicircular tab cut from each leg adjacent its transverse crease to close off said bottom wall opening.

4,611,713
SAW BLADE STORAGE COVER

James E. Byrns, 1027 2nd Ave. South, Clinton, Iowa 52732

Filed Sep. 13, 1985, Ser. No. 775,575
Int. Cl.[4] A45C 11/26
U.S. Cl. 206—349 11 Claims

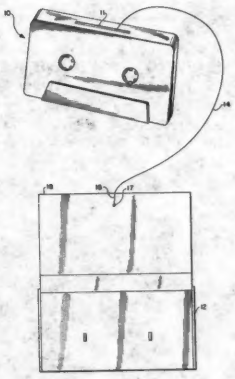


1. A cover for a container, the cover storing a rotary saw blade therein, the cover adapted to close the top of the container, the container adapted to carry a portable, rotary saw such as an electric saw, the cover being of a double wall construction, the inner wall of the cover having a flexible, projecting platform, a raised portion of the inner wall extending beyond the platform, a slot located at the junction of the periphery of the platform adjacent said raised portion of the inner wall, said raised portion carrying first abutment means for limiting the movement of the saw blade in at least one direction, second abutment means carried by the inner wall for limiting the movement of the saw blade in an opposite direction from said at least one direction, a portion of said platform being in surface to surface opposing relation with one surface portion of the saw blade, whereby the resiliency of the platform and the first and second abutments maintain the saw blade in stored position between the abutments and prevent the teeth of the saw blade from coming into contact with the outer wall of the cover during transport of the container.

4,611,714
CONNECTING SYSTEM

Ronald L. Behrens, 1937 Warren Ave., #201 (III), Longmont, Colo. 80501

Filed Mar. 25, 1985, Ser. No. 715,284
Int. Cl.[4] B65D 85/672
U.S. Cl. 206—387 15 Claims

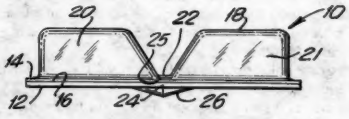


1. A system for securing a recording tape cassette to a storage case for said cassette, said system comprising a cassette, a storage case and a length of flexible cord for fastening at one end to said cassette and means for fastening at its opposite end to said storage case, wherein said cassette includes a slotted aperture in which one end of said cord is captured in a manner such that said end of said cord may slide along the length of said aperture, wherein said cord does not interfere with the playing of said cassette in a player, and wherein said cord is adapted to be enclosed within said storage case when said cassette is placed therein.

4,611,715
DISPENSER PACKAGE

Sanford Redmond, 1385 York Ave., New York, N.Y. 10021

Filed Oct. 16, 1984, Ser. No. 661,564
Int. Cl.[4] B65D 75/36, 75/58
U.S. Cl. 206—484 10 Claims



1. In a dispensing package for a flowable substance, said package including a relatively stiff substantially flat sheet and

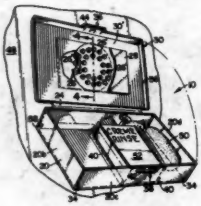
a flexible sheet secured to one face of said relatively stiff substantially flat sheet, said flexible sheet forming an enclosed pouch adjacent said one face of said relatively stiff substantially flat sheet for containing a flowable substance, said relatively stiff substantially flat sheet having a fault pattern of predetermined length whereby, upon bending said relatively stiff substantially flat sheet into a "V" about an axis extending along said fault pattern so that the arms of said "V" encapture said enclosed pouch, said fault pattern ruptures to create at least one opening through which said flowable substance is dispensed, the improvement therein which comprises: said enclosed pouch having a pair of enlarged product-containing pockets spaced laterally on either side of said fault pattern and a connecting wall extending between said pockets located directly behind said fault pattern, said connecting wall forming a shallow connecting channel area adjacent the back side of said relatively stiff substantially flat sheet, whereby, upon initial bending of said relatively stiff substantially flat sheet and prior to rupture of said fault pattern, said connecting wall is caused to flex into pressing engagement with the back side of said relatively stiff substantially flat sheet to thereby force flowable product out of said channel area and into each of said pockets.

4,611,716

CLOSABLE HANGING VESSEL AND METHOD OF USE

Mark D. Sorlien, 1915 Birch Ave., White Bear Lake, Minn. 55110

Filed Apr. 29, 1985, Ser. No. 728,239
Int. Cl.[4] B65D *1/24*; A45D *42/14*
U.S. Cl. 206—581 **10 Claims**



1. A closable vessel including:

a main body having a planar bottom and four sides each perpendicular to and contiguous with said bottom and rising above the plane of said bottom to form a box;

a lid portion having an inside and an outside, said lid hingeably connected to one of said sides and movable from a first position wherein the vessel is open to a second position wherein said lid cooperatively engages said four sides and said lid lies in a plane substantially parallel to and spaced from said bottom and said vessel is closed; the improvement comprising:

(a) a means for removably affixing said vessel to a smooth surface, said means including a single suction cup web including suction cups facing in opposite directions and a number of said cups extending through openings in said lid for affixing a mirror to said lid while said oppositely facing cups affix said vessel to said smooth surface, said suction cup means located on the outside of said lid so that when said lid is in said first position and said vessel is affixed to said smooth vertical surface, said plane of said bottom portion hangs between 10 and 50 degrees above the vertical direction;

(b) drain holes provided in said sides and said bottom of said main body;

(c) means for latching said lid to said body when said lid is in said second position;

(d) a container for liquid soap or shampoo, said container sized to fit within said main body portion and retained within said vessel, said container retained against the bottom and one of said sides by gravity;

(e) partition members contiguous with said bottom and lying substantially parallel to one of said sides and extending above said bottom plane; and

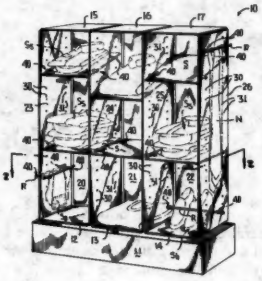
(f) a living hinge connecting said lid and said main body.

4,611,717

DISPLAY CASE WITH IMPROVED SHELF AND ROD BRACKETS

Frederick O. Hutson, Fort Smith, Ark., assignor to Gemtron Corporation, Sweetwater, Tenn.

Filed Apr. 25, 1985, Ser. No. 727,018
Int. Cl.[4] A47F *7/08*
U.S. Cl. 211—34 **5 Claims**



1. A display stand comprising at least two spaced generally parallel vertical walls each having a plurality of openings therein, a pair of brackets adjacent a pair of openings of each vertical wall, each bracket including an elongated body of a generally U-shaped configuration defined by a pair of spaced legs and an arm joined therebetween, and article-supporting shelf having opposite lateral edges, slot means defined by each of said pair of legs and arm for supportingly receiving therein said lateral edges thereby supporting said shelf in spanning relationship between said vertical walls, a threaded bore in and normal to each said arm, a threaded fastener spanning an associated opening and being threaded in an associated threaded bore for retaining said brackets upon said vertical walls, a second bore in each body, and the second bores of the pair of brackets on each wall being aligned whereby a rod can be positioned with opposte ends disposed one each in the second bores of the pair of brackets on each vertical wall for supporting articles by the rod of each vertical wall.

4,611,718

DEVICE FOR STORING A PLURALITY OF DISHES OR THE LIKE IN A PLURALITY OF STACKS

Robert J. Cohn, Dallas, and Michael J. Sudimak, Shavertown, both of Pa., assignors to Intermetro Industries Corporation, Wilkes-Barre, Pa.

Filed Sep. 13, 1984, Ser. No. 650,244
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 **27 Claims**

1. A device for storing a plurality of objects such as dishes or the like in a plurality of stacks each at an object region therein, said device comprising:

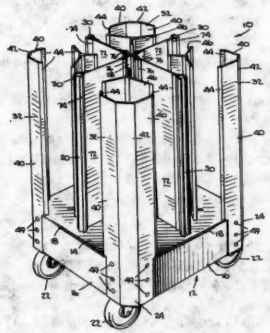
generally square base means;

corner-defining means projecting generally perpendicularly from said base means and defining the corners of each of four quadrant regions;

divider means removably mountable on said base means for separating said quadrant regions when mounted; and

partition means mounted in each of said quadrant regions for selectable movement among first, second, and third fixed positions; all of said partition means, when in said first

fixed positions with said divider means mounted, cooperating with said corner-defining means and said divider means to define four generally equally sized primary object regions; when in said second fixed positions with said divider means demounted, cooperating with said



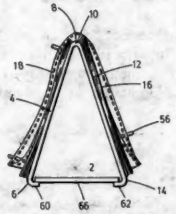
corner-defining means to define eight generally equally sized secondary object regions; and when in said third fixed positions with said divider means mounted, cooperating with said corner-defining means and said divider means to define twelve generally equally sized tertiary object regions.

4,611,719

HOLDER FOR WORKING WITH COMPUTER PRINT-OUTS

D'Ann Dudek, and Wilma Dudek, both of 12160 Catawba Ct., Lockport, Ill. 60441

Filed Aug. 16, 1984, Ser. No. 641,232
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—50 **4 Claims**



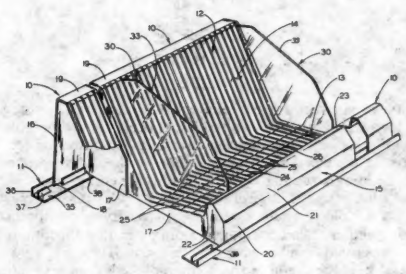
1. A holder for working with computer print-outs in combination with a computer print-out, comprising a first support means to hold a computer print-out comprising a plurality of joined sheets folded one on top of another in a stack and to display a top one of said sheets to a worker for processing, a second support means in longitudinal alignment with said first support means formed integrally therewith and permanently held at a rigid angle thereto to comprise a unitary stand to receive and hold said top one of said sheets when lifted from said stack and pivotally flipped toward said integrally formed second support means for positioning thereon and to then display to said worker a second one of said sheets joined to said top one, including first holding means to releasably hold said sheets of said computer print-out on said first support means when placed thereon and second holding means to hold said sheets of said computer print-out on said second support means when placed thereon, including said computer print-out thereon, said computer print-out comprising a plurality of longitudinally joined continuous sheets of paper folded one on another along laterally extending fold lines, each of said sheets having a longitudinally extending left hand margin along one side thereof and a longitudinally extending right hand margin along the opposite side thereof, each of said margins including a plurality of uniformly spaced apart apertures therein, said first and second holding means being positioned on said first and second support means respectively to engage corresponding ones of said apertures in said left and right hand margins for holding said sheets thereon.

4,611,720

DISPLAY RACK SYSTEM FOR CANDLES

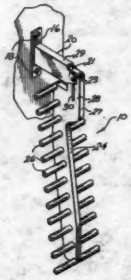
Robert J. Staab, Maineville, Ohio, assignor to Lancaster Colony Corporation, Columbus, Ohio

Filed Apr. 13, 1984, Ser. No. 600,097
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—60.1 **19 Claims**



1. A merchandise display system comprising a display rack of predetermined longitudinal extent having an article supporting surface adapted to receive and support thereon articles of merchandise of elongated, rod-shaped configuration is upstanding relationship on their bottom ends, said article supporting surface including a generally horizontally disposed base support surface and an article supporting wall projecting upwardly with respect to said base support surface with said base support surface and article supporting wall extending longitudinally of the rack and cooperatively defining an upwardly opening channel of V-shaped cross section, said article supporting wall being inclined with respect to a vertical plane in a direction away from said base support surface whereby elongated articles of merchandise positioned on said base support surface in upstanding relationship may repose against said article supporting wall, said base support surface and said article supporting wall having formed therewith a plurality of alternatingly disposed rib and groove conformations extending transversely thereacross to cooperatively engage with articles of merchandise positioned on said rack and restrain the merchandise against movement longitudinally of said rack, said grooves each being of a width less than the transverse dimension of the articles of merchandise to receive only a peripheral portion of the merchandise with respective ones of the grooves in said article supporting wall and said base support surface being longitudinally aligned, and at least two partition plates each having marginal edge portions thereof adapted to interfit in a selected groove and to be thereby supported in upright relationship to said article supporting surface and extending a predetermined distance therefrom to form a compartment between each two adjacent partition plates for retaining articles of merchandise therebetween, said rack including an elongated, upstanding front wall extending longitudinally in spaced relationship to said article supporting wall and having a plurality of rib and groove conformations formed therein in alignment with respective ones of the ribs and grooves of said article supporting wall and base support surface and adapted to mechanically interengage with said partition plates.

4,611,721
TIE AND BELT RACK
Curtis R. Heckaman, South Bend, Ind.
Filed Apr. 9, 1984, Ser. No. 598,059
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—100 **2 Claims**

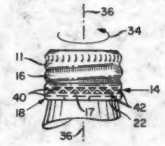


1. A storage rack for clothing and accessories comprising a bracket adapted for mounting to a support, and an arm having projection means for supporting an article of clothing or accessory, said bracket having spaced side walls and spaced end walls defining a tubular opening, said bracket end walls each terminating in an end edge at said bracket opening, said bracket side walls including tabs extending forwardly of said bracket opening and end wall end edges, a pin extending through said tabs across said bracket opening, said arm including a transverse slot at one end portion thereof, said pin extending through said arm slot, said arm being shiftable about said pin from a storage position wherein said arm hangs by said pin generally vertically from said bracket means, and first and second operative positions wherein said arm is supported by said pin in a generally horizontal orientation, said arm in its said first operative position having its said one end portion extending into said bracket opening and contacting one of said bracket end walls when said bracket projects horizontally from said support, said arm in its said second operative position having its said one end portion extending across said bracket opening and contacting one of said bracket end wall end edges when said bracket projects vertically from said support.

4,611,722
MULTIPLE AND STORABLE WIND INSTRUMENT MUTE HOLDER
Carl W. Teig, 11037 Pleasant Valley Rd., Sun City, Ariz. 85351
Filed Jan. 28, 1985, Ser. No. 695,677
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—107 **8 Claims**

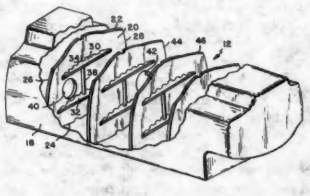
1. A mute holder for use with a music stand having a vertical member, comprising:
a rigid cylindrical member attached at a position parallel to said vertical member of said music stand, said cylindrical member having a circular plate attached to each end of said cylindrical member, each of said circular plate has a centrally-located aperture;
a bolt secured inside a cylindrical member;
extensions rotatably coupled to said cylindrical member;
holding means attached to said extensions for holding mutes to said cylindrical member;
tensioning means for properly securing said mutes to said cylindrical member; and
spring clip means attached to said cylindrical member suitable for protruding to distant portions of said cylindrical member, said spring clip members are made of flexible metals for attaching said cylindrical member to said vertical member of said music stand.

4,611,723
CONTAINER CLOSURE WITH EXPANDABLE ANTI-MISSILING SECTION
William Megowen, 4 Baker's Brook, South Dartmouth, Mass. 02748
Filed Oct. 15, 1985, Ser. No. 787,037
Int. Cl.[4] B65D *51/16*
U.S. Cl. 215—252 **17 Claims**



1. An improved container closure comprising:
a shell with top and side walls and disposable over an opening in a container;
a threaded portion in said side wall for engaging threads on the container;
an axially expandable section in said shell; and
a safety section in said side wall below said expandable section for provisionally securing said shell to a fixed element on the container at least until said expandable section expands.

4,611,724
FLUID-STORAGE TANK
Robert L. Watkins, Blue Hill, Me., and Kenneth R. Peters, Chelmsford, Mass., assignors to JBF Scientific Company, Inc., Southwest Harbor, Me.
Filed Aug. 16, 1985, Ser. No. 766,259
Int. Cl.[4] B65D *7/02*
U.S. Cl. 220—5 A **8 Claims**



1. For containing fluid, a tank comprising:
A. an elongated shell defining an interior chamber; and
B. at least one baffle extending transversely of the longitudinal axis of the shell, the baffle having a substantially

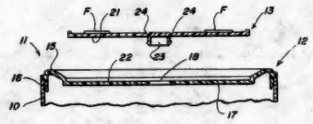
straight first cross section taken in a first direction normal to the longitudinal axis and having a second, curved cross section taken in a second direction normal to the longitudinal axis and the first direction, the second cross section having at least one concave portion and one adjoining convex portion and having a derivative of axial displacement with respect to distance in the second direction that changes only gradually with respect to distance in the second direction.

4,611,725

TAMPER EVIDENT BREAKAWAY CLOSURE FOR CONTAINERS

Christ D. Kacalieff, St. Louis, Mo., assignor to Chris Kaye Plastics Corp., St. Louis, Mo.

Filed Nov. 4, 1985, Ser. No. 794,775
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—253 **7 Claims**



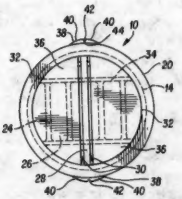
1. A tamper evident closure for a container comprising:
(a) a molded plastic base attachable to a container;
(b) a rotor cooperating with said base and exposed to the exterior of the container so as to be in a position to make tampering with the container visually evident;
(c) said base having a rim and a wall recessed below and surrounded by said rim, said recessed wall having a punch-out tab forming a dispensing opening when punched, and a hole in said recessed wall substantially centered to said surrounding rim; and
(d) said rotor covering said punch-out tab and hole and having a boss projecting from a first surface of said rotor for secured reception in said hole in said recessed wall, and said rotor having a second surface opposite said first surface exposed to view, said second surface having a score therein opposite said boss for weakening said rotor in the area of said boss to provide for breakage, whereby said boss separates from said rotor in response to tampering with said rotor leaving a visible hole in said rotor.

4,611,726

UTILITY CONTAINER CONFIGURED FOR USE WITH AN OPEN-TOPPED VESSEL

John A. Skinnell, Lynchburg, Va., assignor to Gordon Rudd, Roanoke and James C. Vaughan, Salem, both of, Va.

Filed Apr. 4, 1985, Ser. No. 720,029
Int. Cl.[4] A01K *97/04*
U.S. Cl. 220—408 **5 Claims**



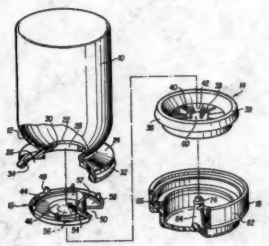
1. A utility container configured for use with an open-topped vessel having a movable handle means for carrying said vessel; said container comprising a receptacle having a top and a bottom and a substantially planar flange depending outwardly from said receptacle above said bottom; said receptacle and said flange being configured approximately to permit said receptacle to be received within said vessel and said flange to engage said vessel to limit the depth of travel of said receptacle within said vessel; said flange further being configured to present an expanse in at least one axis greater than the reach of said handle means; said container further comprising engagement means for engaging said handle means and locking said container with respect to said vessel to form a unitary assembly; said engagement means comprising at least one concavity integrally formed substantially at the intersection of said at least one axis and the edge of said flange; whereby, when said container is received within said vessel in a position presenting said expanse to said handle means when said handle means is in a position appropriate for carrying said vessel and said handle compressively engages said flange, wherein said engagement means further comprises camming means adjacent each of said at least one concavity for cammingly guiding said handle means to said at least one concavity, said camming means being substantially coplanar with said flange.

4,611,727

SOLID ORAL DOSAGE DISPENSER WITH SAFETY, TAMPER-PROOF AND SANITATION FEATURES

James C. Graff, 105 W. Queens Dr., Williamsburg, Va. 23185

Filed Feb. 20, 1985, Ser. No. 703,370
Int. Cl.[4] B65H *3/00*
U.S. Cl. 221—154 **14 Claims**



1. A tablet or capsule cap assembly for dispensing tablets or capsules from a container comprising:
a container neck having a passage wall defining an entrance opening through which tablets or capsules to be dispensed must pass in preparation for being dispensed from said container, said passage wall flaring outwardly downstream of said entrance opening to define a delivery compartment positioned laterally of said entrance opening so that said tablets or capsules must move laterally to enter said delivery compartment, said compartment being bounded by radially positioned slats, said delivery compartment being of such a size that only a specific number of tablets or capsules will fit therein;
a carousel member positioned adjacent said radially positioned slats to prevent tablets or capsules from passing from said delivery compartment, said carousel member having freedom of rotation relative to said container neck means in one direction, but not substantially in the other direction, said carousel member having a tablet-carrying surface with an opening therethrough of such a size and position for rotating to a position aligned with said delivery compartment and thereby allowing a tablet or capsule to pass from said delivery compartment through said rotating opening, the slats being separated from the tablet-carrying surface of said carousel member by a distance which is less than the smallest dimension of a tablet or capsule to be dispensed therewith and said carousel mem-

ber including a radial wall at a trailing edge of said rotating opening for contacting a tablet or capsule located in said delivery compartment to thereby prevent further rotation of said carousel member unless a tablet or capsule is dispensed and an internal wall at an internal edge of said rotating opening to isolate said tablets or capsules at said delivery compartment from tablets or capsules passing through said entrance opening;

means for rotating said carousel member relative to said neck whereby once a container is inverted, a tablet or capsule enters said delivery compartment and said slats hold said tablet in said delivery compartment so that as said carousel member is rotated it slides along said tablet-carrying surface of said carousel member until said tablet or capsule falls through said carousel opening.

4,611,728

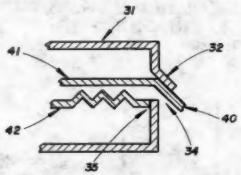
BAG DISPENSING PACKAGE

Stephen F. Compton, Wellford, and Richard D. Thomas, Mauldin, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 452,359, Dec. 23, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 675,480

Int. Cl.[4] B65D *25/52*

U.S. Cl. 221—63 **13 Claims**



1. A package of bags adapted for dispensing and opening said bags one at a time, comprising:

(a) a chain of imbricated bags in overlying sequence, each bag being adhesively but releasably attached to the upper side of the next adjacent bag, each bag having an open mouth end directed toward the leading end of said chain, each bag overlying the mouth of the next adjacent bag: and,

(b) a container for said chain having an elongate, constricted opening through which the leading end of said chain is directed, the length of said opening being less than the bag chain width by a selected extent sufficient to cause the mouth of each bag to open in response to transverse constriction as said chain is pulled through said opening, the width of said opening being sufficiently narrow so that the lower edge of the opening resistively confronts the lower edge of the mouth of a bag being pulled through said opening whereby as the leading bag is pulled through the opening is pulls on the upper side of the next adjacent bag thereby pulling the mouth-end of said upper side through the opening while the lower side confronts the lower edge of the opening.

4,611,729

UNIVERSAL NOZZLE BOOT FOR FUEL DISPENSER

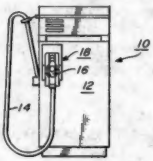
William J. Gerstenmaier, and Richard G. Bisker, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 28, 1984, Ser. No. 645,380

Int. Cl.[4] B67D *5/12*

U.S. Cl. 222—75 **7 Claims**

1. In a fuel dispenser including a cabinet, operating components housed within said cabinet and adapted for connection to a source of fuel for dispensing, a dispenser nozzle, a flexible hose extending connected from said operating components internally of said cabinet to said dispenser nozzle externally of said cabinet, and a nozzle boot receptacle on said cabinet having an opening into which said nozzle can be inserted for supporting said nozzle during periods of non-use, the improvement in said nozzle boot receptacle comprising means to adjustably preset the effective size of said nozzle boot opening to accommodate nozzles of different size.



4,611,730

TONER REPLENISHING DEVICE

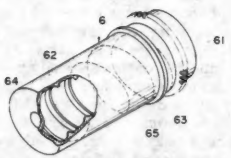
Masumi Ikesue, Tokyo, and Takashi Ikeda, Sagamihara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,022

Claims priority, application Japan, Jan. 9, 1984, 59-1729

Int. Cl.[4] B67D *5/64, 3/00;* B65D *88/54;* B67C *3/26*

U.S. Cl. 222—167 **20 Claims**



1. A cartridge for use with a toner replenishing device and for detachably, sealingly and rotationally engaging within a cylindrical receptacle of the toner replenishing device for the feeding of toner from said cartridge into the toner replenishing device, comprising:

a main portion for containing therein a quantity of toner, said main portion comprising a substantially hollow container having a longitudinal axis and first and second oppositely-disposed ends, said first end being closed, said second end comprising a mouth portion, said mouth portion being integrally formed with said main portion and comprising a substantially annular sidewall having an external circumferential configuration suitable for rotatingly and sealingly engaging within the cylindrical receptacle of the toner replenishing device, said substantially annular sidewall terminating in a plane perpendicular to said longitudinal axis, said main portion being open at said mouth portion for the egress of toner,

said main portion further comprising a spiral guide rib formed on the inner surface thereof and longitudinally extending therein, said guide rib comprising means for moving toner in said cartridge toward said mouth portion and out of said main portion in response to rotation of said cartridge; and

a gear-tooth-bearing member having therein a substantially axially-disposed opening, said gear-tooth-bearing member being removable from and mateable with said main portion by inserting and removing said main portion into and from said axially-disposed opening of said gear-tooth-bearing member, there being gear teeth formed on an outer circumference of said gear-tooth-bearing member, said gear-tooth-bearing member being disposed circumferentially on an external surface of said main portion and in

snugly-fitting relation therewith, said snugly-fitting relation being sufficient to render said gear teeth effective to rotate said main portion in response to a driving force applied to said gear teeth.

4,611,731
AUTOMATIC METERING APPARATUS

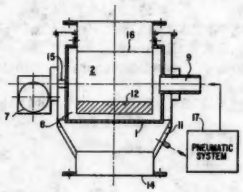
Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 683,999

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346783

Int. Cl.⁴ G01F *11/10*

U.S. Cl. 222—636 **10 Claims**



1. An apparatus for volumetric metering of variable batches of pourable material comprising:

a hollow air-tight container rotatable about an axis;

a single metering chamber inserted into the periphery of said container extending through the central portion thereof and occupying a major portion of the interior volume of said container, said metering chamber having an opening at said periphery forming a charge port therein for receiving said pourable material and having walls at least part of which are gas permeable;

a pneumatic system connected to the interior of said air-tight container and operative through said gas permeable walls as a pneumatic system applied to said metering chamber; and

means for varying the volume of said metering chamber comprising space filling bodies insertable into said metering chamber.

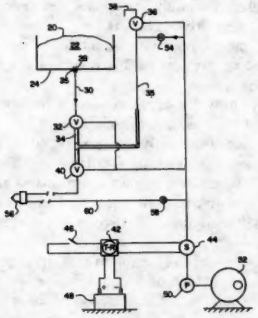
4,611,732
APPARATUS FOR DISPENSING LIQUID

Charles C. King, III, Germantown, Tenn., assignor to K-Sun Company, Inc., Memphis, Tenn.

Filed Dec. 20, 1984, Ser. No. 684,112

Int. Cl.⁴ B67D *5/34, 5/08*

U.S. Cl. 222—639 **1 Claim**



1. A dispensing system comprising:

a reservoir adapted to contain liquid to be dispensed,

an atomizing dispensing nozzle,

a trap chamber below the reservoir in conduit means connecting the reservoir and the dispensing nozzle,

a normally open first valve means in the conduit between the trap chamber and the reservoir,

a normally closed second valve means in the conduit between the trap chamber and the nozzle,

a vent leading from the trap chamber to the atmosphere,

a normally open third valve means in the vent,

supply means for compressed air,

piping leading from the compressed air supply means to said nozzle and to said trap chamber,

a normally closed control valve in the piping between said air supply means and the trap chamber and said nozzle, and

means for simultaneously closing the first and third valve means while opening the second valve means

whereby air under pressure forces liquid from the trap chamber through the nozzle and atomizes the liquid issuing from the nozzle,

the means for simultaneously closing the first and third valve means while opening the second valve means being characterized in that each of said valve means is compressed air actuated, and said piping also including branches leading from downstream of said control valve to said first, second and third valve means wherein the air that atomizes the liquid issuing from the nozzle is fed through a line from the air supply means to the nozzle at the same time as the liquid in the trap chamber is being fed to the nozzle by the force of pressurized air from the air supply means.

4,611,733
APPARATUS FOR AUTOMATICALLY RELOCATING THE STOCKING TOE PART CORRECTLY ON THE SETTING FRAME

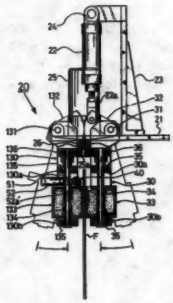
Masao Nishikawa, Nara, and Michikazu Naohara, Yamatotakada, both of Japan, assignors to Takatori Machinery Mfg. Co., Ltd., Nara, Japan

Filed Jun. 14, 1985, Ser. No. 744,688

Claims priority, application Japan, Jun. 22, 1984, 59-129871

Int. Cl.⁴ D06C *5/00*; A47G *25/80*

U.S. Cl. 223—75 **6 Claims**



1. An apparatus for automatically relocating stocking toe parts correctly on setting frames, comprising:

a conveyor on which the setting frames covered with yet steam untreated stockings are transferred;

a steam setter arranged along the conveyor;

swingable members dangling above the conveyor in front of the steam setter;

relocating means, attached to a lower part of said swingable members, for correcting the position of the stocking toe parts; and

a seam locator means, attached to one of said swingable

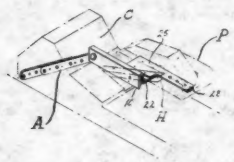
members, for locating the position of the stocking toe parts in order for said relocating means to be able to correct the position of the stocking toe parts.

4,611,734

MOBILE PHONE MOUNTING

R. Kent Luecking, 3507A Shenandoa, St. Louis, Mo. 63104, and James E. Cravens, 927 Pontoison Dr., St. Louis, Mo. 63011

Filed Jun. 19, 1984, Ser. No. 622,101
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—42.42 **16 Claims**



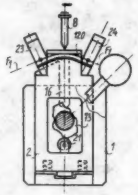
1. For use in a vehicle having first and second discrete front seats with there being a spacing between the same, said spacing having a floor, a mobile phone mounting comprising linkage means, bracket forming means secured to said vehicle floor within said spacing, means securing the lowermost end portion of said linkage means to said bracket means for projection of the upper or opposite end portion of said linkage means in upwardly spaced, forwardly directed relationship to said spacing floor, an arm, carried by said linkage means, for disposition within the upper portion of said spacing, adjustable means engaging the upper portion of said linkage means to said arm for providing a selected angular relationship of said arm relative to said floor, support plate means carried by said arm, hinge means for hingedly securing said support plate means to said arm for movement of said support plate means between substantially horizontal, operative position and substantially vertical, inoperative position, and means engaging a mobile phone upon said support plate means for movement therewith.

4,611,735

DEVICE FOR SPLITTING AT LEAST ONE OPTICAL FIBRE

Marie C. Soster, Rueil Malmaison, and Roger Anastasie, Paris, both of France, assignors to Socapex, Suresnes, France

Filed Jan. 17, 1985, Ser. No. 692,126
Claims priority, application France, Jan. 20, 1984, 84 00891
Int. Cl.[4] C03B *37/16*
U.S. Cl. 225—96.5 **9 Claims**



2. A device for splitting at least one optical fibre, comprising:

a flexible support for receiving said fibre;

a tool for initiating the splitting at a location on said fibre;

force exerting means for holding said fibre on either side of said location and for bending said flexible support, said force exerting means including at least two clamps;

said clamps being adapted to bear on said fibre and said flexible support so as to prevent any sliding displacement of said fibre and being rotated so as to cause said flexible support to bent;

a movable slide for controlling the motion of said two clamps and including an adjustable roller; and

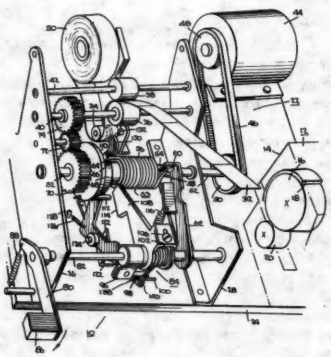
a cam acting in cooperation with said adjustable roller, for actuating said movable slide.

4,611,736

TAPE FEEDING APPARATUS FOR MAILING MACHINE

German Gavronsky, Stamford, and Leo Wologodzew, Huntington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,839
Int. Cl.[4] B65H *20/04*
U.S. Cl. 226—134 **7 Claims**



1. In a mailing machine having a supply of tape and a printing instrumentality for printing postage indicia on a discrete portion of the tape, a tape feeding apparatus for feeding only a single discrete portion of the tape to the printing instrumentality each time the mailing machine is activated, said tape feeding apparatus comprising:

A. means for feeding tape from the supply thereof,

B. means for driving said tape feeding means,

C. a first clutch assembly interposed between said feeding means and said driving means,

D. latching means normally maintaining said first clutch disengaged to prevent said driving means from driving said feeding means,

E. a manually movable actuating means for initiating operation of said tape feeding means,

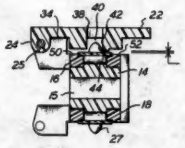
F. a second clutch assembly interposed between said actuating means and said latching means for disabling said latching means when said actuating means is moved to an actuating position to permit said first clutch to engage to cause said driving means to drive said tape feeding means, and

G. means responsive to rotation of said first clutch assembly to disengage said second clutch assembly to reset said latching means thereby limiting rotation of said first clutch assembly to one revolution regardless of whether said manual actuating means is held in said actuating position.

4,611,737
TRACTOR APPARATUS

John D. Hubbard, and Leo J. Kerivan, both of Somerset, Mass., assignors to Precision Handling Devices Inc., Fall River, Mass.

Filed Apr. 8, 1985, Ser. No. 721,100
Int. Cl.[4] G03B 1/30
U.S. Cl. 226—74 25 Claims

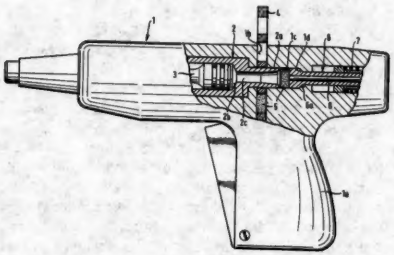


1. A tractor for feeding a perforated web which comprises a web drive member having a pitch line, said web drive member having pins extending above said pitch line and spaced from each other a distance equal to the pitch of the perforations in said web so as to enter and engage said web in said perforations, a frame in which said member is movably mounted with said pitch line along a given path in a region of said member where said pins enter and are engaged in said perforations, and a lid movable toward and away from said frame and having a surface disposed opposite to said region of said member when moved toward said frame which is then spaced sufficiently close to said pitch line to locate said web substantially at said pitch line.

4,611,738
EXPLOSIVE POWDER DRIVEN FASTENING ELEMENT SETTING DEVICE

Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Continuation of Ser. No. 505,120, Jun. 20, 1983, which is a continuation of Ser. No. 233,186, Feb. 10, 1981, abandoned. This application Jul. 18, 1984, Ser. No. 631,529
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005342
Int. Cl.[4] B25C 1/08
U.S. Cl. 227—9 1 Claim

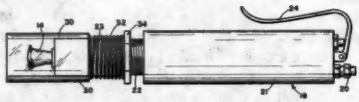


1. A setting device adapted to use an explosive powder propellent for driving fastening elements, such as bolts, nails and the like, into a hard receiving material with the powder propellent being in the form of caseless propellent charges, comprising a casing having a front end and a rear end, means within said casing for forming an axially extending combustion chamber with the axis of said chamber extending transversely of the front end of said casing and said combustion chamber having a first end and a second end spaced apart in the axial direction of said chamber and an axially extending side wall extending between the first and second ends of said combustion chamber, said means comprising an axially extending feed element displaceably positionable in the axial direction of said combustion chamber within said casing and having a first end and a second end with the first end closer to the front end of said casing than said second end, an axially extending counterpressure member in axial alignment with said feed element and having a first end and a second end, said counterpressure member located closer to the rear end of said casing than said feed element, the second end of said feed element forming said first end of said combustion chamber and the first end of said counterpressure member forming said second end of said combustion chamber and the first end of said counterpressure member arranged to provide surface contact across the end thereof with the caseless propellent charge located within said combustion chamber, said counterpressure member being axially slidably displaceable within said casing in the axial direction of said feed element by said feed element displacing the propellent charge, said casing forming said side wall of said combustion chamber, said counterpressure member having a frusto-conical surface thereon encircling the axis of said counterpressure member with said frusto-conical surface spaced from and between the first and second ends of said counterpressure member and tapering inwardly in the direction away from said feed element toward the second end of said counterpressure member and being axially slidable relative to said casing, means located within said casing between said frusto-conical surface and the rear end of said casing for biasing said counterpressure member in the axial direction toward the front end of said casing and said casing having a stationary frusto-conical surface therein diverging toward the front end of said casing and being complementary to said frusto-conical surface on said counterpressure member and arranged to receive said frusto-conical surface on said counterpressure member in sealing contact with said frusto-conical surfaces having exactly the same cone angle, the complementary said frusto-conical surfaces on said counterpressure member and said casing being ground together in engagement with one another for providing a sealing quality as high as possible, said counterpressure member having an axially extending cylindrically shaped larger diameter section extending from the first end thereof to the larger diameter end of said frusto-conical surface thereon and an axially extending cylindrically shaped smaller diameter section extending from the smaller diameter end of said frusto-conical surface toward the second end thereof, and said larger and smaller diameter sections extending from said frusto-conical surface being in axially sliding surface contact with said casing as said frusto-conical surface approaches sealing contact with the stationary frusto-conical surface of said casing, whereby said biasing means biases said frusto-conical surface on said counterpressure member in the axial direction toward the front end of said casing and out of engagement from said frusto-conical surface on said casing, and when said feed element is displaced toward the rear end of said casing said feed element forms the first end of said combustion chamber, said counterpressure member moves axially in sliding contact with the surface of said casing forming the side wall of said combustion chamber toward the rear end of said casing and said frusto-conical surface on said casing forms a stop for the axial displacement of said counterpressure member moving toward the rear end of said casing and in the stopped position said frusto-conical surfaces are disposed in stationary contacting engagement and form a seal for propellent gases when a caseless propellent charge is ignited within said combustion chambers, ignition means being located within said casing for firing a caseless propellent charge positioned within said combustion chamber, said ignition means being located within said counterpressure member, and said ignition means comprises an ignition electrode.

4,611,739
SHEETROCK HAMMER ATTACHMENT

Danny E. Rowton, Cameron, Okla., assignor to Henry O. Arnall and Royce J. Skelton, both of Poteau, Okla.

Filed Aug. 5, 1985, Ser. No. 762,680
Int. Cl.[4] B25C *1/04, 7/00;* B25D *7/00*
U.S. Cl. 227—66 5 Claims

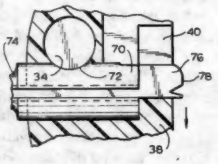


1. A sheetrock hammer attachment for use with a pneumatic power hammer operator of the type having a rear body portion and a forward body portion wherein said forward portion comprises a cylindrical threaded bore and a smooth outer sleeve covering the front end of said bore, and an actuating means wherein depressing said actuating means provides a vibrating action to a hammer received in said bore; comprising a hardened steel hammer having a rounded forward head and an elongated shaft extending rearwardly therefrom, said elongated shaft being received in said bore and being operationally connected thereto, a central portion of said head being drilled away to provide a cylindrical hole, a smaller cylindrical magnet for holding the head of a nail being received in said hole, an insulating means received in said hole between said magnet and said head for retaining said magnet in said hole, a tension spring being wound about a portion of said outer sleeve, a clear shield covering the front end of said sleeve and extending forwardly therefrom, the forward end of said shield directly adjacent a panel of sheetrock, said shield being rotatably affixed to the forward end of said spring, and an adjustment means adjacent the rear portion of said spring, for controlling the length of said spring, wherein depressing said actuating means vibrates said hammer causing said shield to reciprocate rearward while compressing said spring and moving said head forward thereby driving said nail into a panel of sheetrock.

4,611,740
UNIVERSAL NEEDLE ASSEMBLY FOR FASTENER ATTACHERS

Steven J. Kunreuther, 285 Central Park W., New York, N.Y. 10024

Filed Mar. 29, 1985, Ser. No. 717,895
Int. Cl.[4] B65C *7/00*
U.S. Cl. 227—67 7 Claims

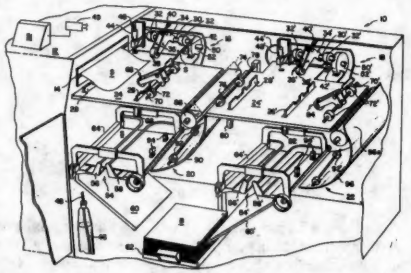


1. A needle assembly for use fastener attaching apparatus comprising a substantially cylindrical base having a side surface, a central bore, and a slot defined by an edge, the plane bisecting said base passing through said slot, a needle part extending from one end of said base and a knife part extending from and beyond the other end of said base, said knife part comprising a substantially planar body situated substantially tangentially to said bore and extending from a point proximate said side surface of said base, through said plane, to a point substantially aligned with said edge of said slot.

4,611,741
BOOKLET FINISHING APPARATUS

William C. Wilson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,544
Int. Cl.[4] B41L *43/12;* B42B *5/00;* B42C *9/00*
U.S. Cl. 227—99 2 Claims



1. Apparatus for receiving one or more sets of sheets with each sheet having one side edge to be bound to other sheets of a set to form a booklet, the apparatus comprising:

an assembly tray having first and second spaced sides;

means for feeding a set of sheets to the tray along a first sheet path that locates the one side edge of each sheet along the first side of the tray;

means for feeding a set of sheets along a second sheet path that locates the one side edge of each sheet along the second side of the tray;

means for directing sheets along the first sheet path or the second sheet path;

means for aligning the one side edge of sheets fed to the tray along the sheet paths;

means located along the first path for applying adhesive to the one side edge of sheets fed along the first path;

means located adjacent the second side of the tray for applying a staple to a set of sheets fed to the tray along the second path; and

control means for operating the adhesive applying means when sheets are directed along the first sheet path and for operating the staple applying means when sheets are directed along the second sheet path.

2. Apparatus for producing a plurality of booklets with each booklet comprising a set of sheets fed seriatim to the apparatus, the apparatus comprising:

first and second adhesive binders for securing sheets of a set of sheets together with adhesive to form a booklet, each of the adhesive binders comprising an assembly tray for receiving sheets fed seriatim to the tray, means for aligning sheets in the tray, and means for applying adhesive to the sheets; first and second stapler/finishers for securing sheets of a set of sheets together with one or more staples to form a booklet, the first stapler/finisher comprising means for stapling together sheets in the assembly tray of the first adhesive binder, the second stapler/finisher comprising means for stapling together sheets in the assembly tray of the second adhesive binder;

means for (1) alternately directing sets of sheets to the first adhesive binder and to the second adhesive binder or (2) alternately directing sets of sheets to the first stapler/finisher and the second stapler/finisher;

means for selectively operating either the adhesive applying means of the first and second binders or the stapling means of the first and second stapler finishers; and

means for collecting finished booklets from the binders and the finishers.

4,611,742

ELECTROMAGNETICALLY OPERATED DRIVING TOOL WITH AIR DAMPER

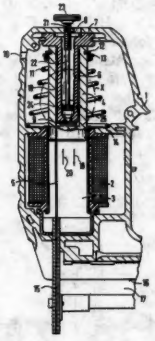
Werner Rieker, Waldenbuch, and Fritz Schädlich, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,757

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437019

Int. Cl.[4] B25C *1/00, 5/02, 5/06, 5/15*

U.S. Cl. 227—131 7 Claims



1. An electromagnetically operated driving tool, comprising a solenoid; a cup-shaped plunger axially slidable within said solenoid; a hollow member axially extended in said plunger and forming therewith an air damper; a check valve cooperating with said hollow member; a return spring acting on said plunger, said hollow member and said plunger forming therebetween a throttle gap; a driver blade connected to said plunger to move therewith, wherein a return stroke of said driver blade is affected by said air damper; and a piston received in said hollow member, said piston causing an elastic expansion of said hollow member whereby said throttle gap formed between an outer surface of said hollow member and an inner surface of said plunger is changed.

4,611,743

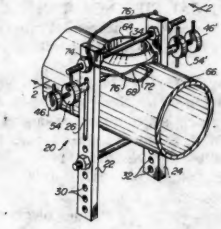
DEVICE FOR ALIGNING A WELDOLET AND A PIPE TO BE JOINED

Stanley B. Williams, 2088 E. Empire, Lot 151, Benton Harbor, Mich. 49022

Filed Jan. 22, 1985, Ser. No. 693,575

Int. Cl.[4] B23K *37/04*

U.S. Cl. 228—49.1 9 Claims



1. A device for supporting a weldolet with a passage therethrough on a pipe in aligned relationship with a passage through a side of the pipe in order that the weldolet and pipe may be joined by welding or the like, the weldolet and pipe passages having substantially equal diameters, comprising frame means positionable around and engageable with the weldolet and pipe to support the weldolet on the pipe; a pair of guide means carried on opposite sides of said frame means, each said guide means including an elongate extension and an elongate guide member at an end of said extension generally perpendicular thereto, said extensions being extendible between the weldolet and pipe on opposite sides of the passages therein and said guide members being extendible within the passages with said frame means supporting the weldolet on the pipe, said extensions then spacing the weldolet a selected distance from the pipe and said guide members being engageable with surfaces of the passages; and means for moving each said guide means toward the side of said frame means on which it is mounted to move said guide members against the passage surfaces on opposite sides of the weldolet and pipe to bring the passages into the aligned relationship for joining the weldolet to the pipe, said guide members and extensions each having a relatively long dimension in the same direction, said long dimension of said guide members being greater than that of said extensions, and a relatively short dimension perpendicular to said long dimensions and less than said long dimensions of said extensions, said extensions being rotatably carried by said frame means for rotation to positions where said long dimensions extend generally parallel to the passage axes, so that the spacing between the weldolet and pipe is equal to said long dimensions of said extensions and said guide members are oriented to engage the passage surfaces upon said moving means moving said guide means toward said frame means and, after the weldolet and pipe are at least partially joined around the space therebetween, for rotation to positions whereat said short dimensions extend generally parallel to the passage axes for removal of said extensions and guide members from between the weldolet and pipe through the space therebetween.

4,611,744

TURBINE BLADE REPAIR

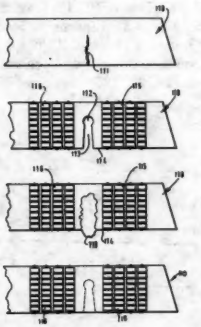
Michael J. Fraser, Birmingham, and Raymond D. Legros, Lower Wick, both of United Kingdom, assignors to Refurbished Turbine Components Ltd., Worcester, England

Filed Jun. 20, 1983, Ser. No. 505,775

Claims priority, application United Kingdom, Jun. 23, 1982, 8218214; Mar. 15, 1983, 83-7164

Int. Cl.[4] B23P *15/02*

U.S. Cl. 228—119 12 Claims



1. A method of repairing a turbine blade, said method comprising the steps of:

(a) applying heating means to selected areas of a turbine blade to be repaired;

(b) heating said areas of the turbine blade to desired temperatures;

(c) carrying out a repair step on said blade, said repair step

involving the application of substantial thermal energy to the blade;

(d) controlling said heating means during said repair step so as to heat said selected areas in a manner to reduce forces acting upon the blade due to the occurrence of thermal expansion in the blade resulting from application of said substantial thermal energy;

(e) said heating means being positioned so that the heat transferred to the turbine blade tends to cause distortion of said blade in a direction substantially opposite to the distortion which is likely to be caused by the repair step involving the application of said substantial thermal energy;

(f) controlling said heating means after said repair step so as to maintain said turbine blade at a predetermined temperature for a predetermined length of time.

4,611,745

METHOD FOR PREPARING HIGHLY HEAT-CONDUCTIVE SUBSTRATE AND COPPER WIRING SHEET USABLE IN THE SAME

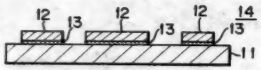
Masako Nakahashi, Kawasaki; Makoto Shirokane; Tatsuo Yamazaki, both of Tokyo; Hisashi Yoshino, Yokohama; Akio Hori, Kawasaki, and Hiromitsu Takeda, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1985, Ser. No. 696,181

Claims priority, application Japan, Feb. 24, 1984, 59-32628

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—123 **12 Claims**



1. A method for preparing a highly heat conductive substrate which comprises interposing an active layer with a thickness of 0.5 to 10 μm comprising silver and an active metal selected from the group consisting of titanium, zirconium and hafnium, between an aluminium nitride substrate and a copper member; and joining said aluminium nitride substrate and said copper member with each other by heating.

4,611,746

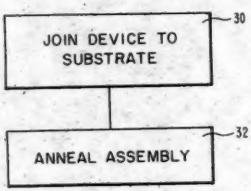
PROCESS FOR FORMING IMPROVED SOLDER CONNECTIONS FOR SEMICONDUCTOR DEVICES WITH ENHANCED FATIGUE LIFE

Ernest N. Levine; Lewis D. Lipschutz, both of Poughkeepsie, and Horatio Quinones, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,386

Int. Cl.[4] B23K *1/00*

U.S. Cl. 228—123 **6 Claims**



1. A process for forming an improved solder interconnection between an integrated semiconductor device and a supporting substrate, of a material that has a coefficient of expansion that differs from the coefficient of expansion of the material of the device comprising

joining the device I/O's to the corresponding I/O's of the substrate by positioning the device over the substrate with solder material selectively positioned between the respective I/O pads, heating the assembly to at least the melting point of the solder material, and cooling to solidify the solder,

subsequently annealing the resultant device and substrate assembly by heating to an annealing temperature in the range of 115° to 135° C. and maintaining it for a time in excess of 2 days.

4,611,747

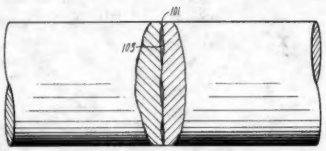
METHOD FOR PRODUCING CONTINUOUS LENGTH HIGH SOLIDS ENAMEL COATED MAGNET WIRE

Dennis L. Peppler; Mohammad F. Zaman, both of Fort Wayne, Ind.; Norman S. Bornstein, West Hartford, and Marvin E. Hartz, Glastonbury, both of Conn., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed May 15, 1985, Ser. No. 734,625

Int. Cl.[4] H01B *13/06*

U.S. Cl. 228—125 **1 Claim**



1. A method of applying magnet wire enamel to continuous lengths of electrically conducting copper or copper alloy wire substrate comprising joining a plurality of wire substrate segments to form a continuous length of wire substrate having at least one joint, preheating and controlling the temperature of the wire substrate to an elevated temperature prior to application of the enamel utilizing as the enamel a nonrecirculating polymer composition having a high solids content and a high viscosity, applying the enamel through a wire-centering coating die at a high speed, and curing the enamel, wherein the improvement comprises:

joining the wire segments by brazing an end of one wire substrate segment to an end of a second wire substrate segment utilizing a braze whose melting point is greater than 1000° F. and less than 1600° F. resulting in a joint that has a tensile strength greater than 27,000 pounds per square inch, and is capable of being conformed to the circumference of the wire substrate segments without substantially altering the surface integrity of the wire.

4,611,748

PROCESS AND APPARATUS FOR FABRICATING OPTICAL FIBER CABLES

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 497,535, May 24, 1983, Pat. No. 4,555,054, which is a continuation-in-part of Ser. No. 413,846, Sep. 1, 1982, Pat. No. 4,508,423, which is a continuation-in-part of Ser. No. 324,242, Nov. 23, 1981, abandoned. This application Oct. 1, 1984, Ser. No. 655,811

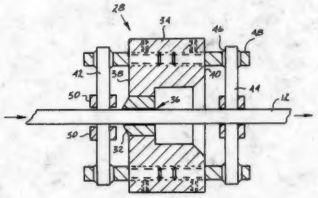
Int. Cl.[4] G02B *5/16;* **B23D** *1/00*

U.S. Cl. 228—170 **12 Claims**

1. An apparatus for fabricating an optical fiber cable, said apparatus comprising:

means for assembling a cable core having a metal containment tube and at least one optical fiber within said tube, said core assembly means including means for forming a strip of metal into said tube, wherein the improvement comprises:

means for providing said strip to said forming means in a substantially burr-free condition and with a width that does not exceed a desired width, said strip providing means comprising a shaving die having a bore through which said strip passes, said bore having a diameter substantially equal to said desired width,



whereby providing said strip in said substantially burr-free condition and with said width not exceeding said desired width promotes smooth operation of said tube forming means.

4,611,749

METHOD OF AND SYSTEM FOR ASSEMBLING A PLURALITY OF PARTS INTO A UNIT

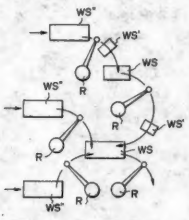
Saige Kawano, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 26, 1984, Ser. No. 674,766

Claims priority, application Japan, Nov. 28, 1983, 58-225241; Nov. 28, 1983, 58-225242; Nov. 28, 1983, 58-225243; Nov. 30, 1983, 58-226098

Int. Cl.[4] B23K *31/00*

U.S. Cl. 228—176 **13 Claims**



1. A method of assembling a plurality of parts into a unit, comprising the steps of:

providing a plurality of single pivoted robots, each robot having a swinging locus and each robot having means for performing work on at least one of said parts and means for transferring said at least one part from one location to another location;

arranging said single pivoted robots so that the swinging locus of each single pivoted robot intersects with that of at least one of the other single pivoted robots;

providing a working station at the intersection of the swinging loci;

causing at least one of the single pivoted robots whose swinging loci intersect to perform work on the part at the working station; and

causing one of the single pivoted robots whose swinging loci intersect to transfer the part to the next station.

12. A welding and assembling system for welding a plurality of parts to form a workpiece comprising a work station for receiving the workpiece, a parts holder for receiving and retaining the plurality of parts in respective predetermined positions, a temporary placing table adapted to support thereon the parts holder, and a robot having a welding gun and adapted to grip the parts holder to transfer it, the work station and the temporary placing table being disposed within the moving locus of the robot, said plurality of parts being loadable on the parts holder on the temporary placing table and being transferred to the work station together with the parts holder by the robot to be welded to form the workpiece on the work station by the robot.

4,611,750

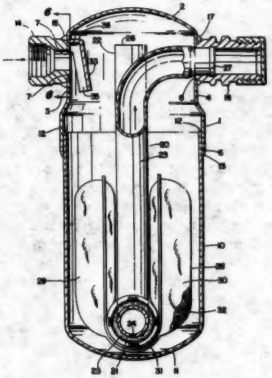
METHOD OF ASSEMBLING AN ACCUMULATOR DEHYDRATOR

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Division of Ser. No. 432,257, Dec. 26, 1982, Pat. No. 4,496,378. This application Sep. 26, 1984, Ser. No. 654,845

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—184 **3 Claims**



1. A method of assembling an accumulator dehydrator cap, a fitting and a deflector comprising:

providing a cap having an opening therethrough,

providing a fitting having a portion smaller than said opening,

providing a deflector having a body and an arcuate flange extending therefrom,

placing said fitting on the outside of said cap and inserting said portion into said opening,

placing said deflector on the inside of said cap and inserting said flange into said opening exteriorly of said fitting, and welding said fitting to said cap.

4,611,751

METHOD AND APPARATUS FOR THE MANUFACTURE OF CYLINDRICAL HOLLOW BODIES

Herbert Lückow; Ulrich Plantikow, both of Dusseldorf, and Siegfried Gröne, Witten-Annen, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 570,050

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300827

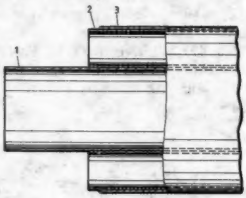
Int. Cl.[4] B23K *9/04, 37/04*

U.S. Cl. 228—184 **11 Claims**

1. In an apparatus for the manufacture of cylindrical hollow bodies by the shape welding process which apparatus comprises a rotatably mounted supporting body which can be driven and which is adapted to support a base body onto which the weld material in deposited, said base body connected to said rotatably mounted supporting body by a connector which comprises at least one elastically deformable element, the

improvement wherein said connector comprises a plurality of elastically deformable elongated metal profiles, each profile extending over the length of the supporting body and detachably fastened to the periphery of said supporting body so as to be detached in one piece for easy removal and wherein the profiles are disposed about said supporting body at regular spaced intervals and said base body is composed of a metal sheet or strip wrapped about said profiles for resilient support and detachably secured thereto.

11. In a method for the manufacture of cylindrical hollow bodies by the shape welding process wherein a supporting



body is rotated with a connected base body onto which weld material is deposited, the improvement comprising detachably connecting the base body to the supporting body with a plurality of elastically deformable elongated metal profiles with each running the length of the supporting body by detachably fastening the profiles to the periphery of said supporting body such that each profile is detachable in one piece for easy removal and disposing the profiles about said supporting body at regular spaced intervals and providing the base body in the form of a metal sheet or strip and wrapping the base body about said profiles for resilient support and detachably securing the base body to the profiles.

4,611,752

METHOD FOR BONDING METALLIC STRUCTURAL ELEMENTS

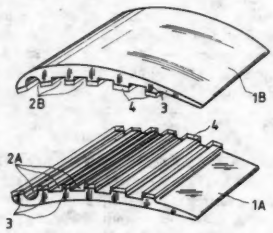
Bernd Jahnke, Neckargemuend, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Apr. 27, 1984, Ser. No. 604,749

Claims priority, application European Pat. Off., Apr. 27, 1983, 83104102.5

Int. Cl.⁴ B23K *20/00*

U.S. Cl. 228—194 **19 Claims**



1. Method for bonding metallic structural elements to form a component, in particular for stationary gas turbines, which comprises locating at least one intermediate layer of nickel-chromium-boron with a thickness between 1 and 50 μm between the structural elements to be bonded, heating the intermediate layer together with the structural elements to a temperature of 1120° to 1230° C., exerting a pressure of 1 to 200 MPa before or after said heating on the structural elements together with the intermediate layer therebetween and maintaining the temperature and the pressure for a sufficient length of time to effect isothermal solidification of the intermediate layer and the alloying material of the structural elements in the joint zone with the formation of a strong bond between the structural elements.

4,611,753

CLOSURE ON A RECTANGULAR CONTAINER FOR STORING OF LIQUID

Wilhelm Kullberg, Kjaerlighetsstien 22, N-1751 Halden, Norway

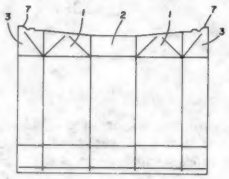
PCT No. PCT/NO84/00052, § 371 Date Jul. 11, 1985, § 102(e) Date Jul. 11, 1985, PCT Pub. No. WO85/02162, PCT Pub. Date May 23, 1985

PCT Filed Nov. 15, 1984, Ser. No. 756,513

Claims priority, application Norway, Nov. 15, 1983, 834174; Oct. 24, 1984, 844237

Int. Cl.⁴ B65D *5/74*

U.S. Cl. 229—17 R **4 Claims**



1. A closure on a rectangular container with a first pair and a second pair of opposite side walls connected by a single joint for storing of liquid, and having a continuous folding line as the lower limitation of the closure and similar first and second faces provided respectively on the first pair of opposite side walls, as well as third and fourth faces provided respectively on the second pair of opposite side walls, said four faces each having a free edge and being connected with each other so as to protrude from the folding line, said first and second faces both including folding lines extending from ends of the continuous folding line on each face to the middle of the free edge of each face so that said fourth face is foldable over a part of said first and second faces, the fourth face connected with said first and second faces by a permanent seal, the third face connected to said first and second faces by a releasable seal whereby the third face forms a spout in an open position of the closure, characterized in that the length of the fourth face perpendicular to the continuous folding line is shorter than half of the distance between the second pair of opposite side walls of the container, thereby providing an air opening to the interior of the container between the free edge of the fourth face and inwardly protruding peaks formed by folding of said first and second faces, the free edge of the third face being provided with an extension at its middle, which when the closure is sealed is arranged above the fourth face and when the closure is opened provides a non-drip spout, and the joint of the side walls of the container being arranged in a symmetrical axis of the third face.

4,611,754

MODIFIED LOCK ARRANGEMENT FOR CARTONS

Robert L. Sutherland, Campbell Hall, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 358,879, Mar. 16, 1982, Pat. No. 4,526,316. This application Apr. 25, 1985, Ser. No. 726,984

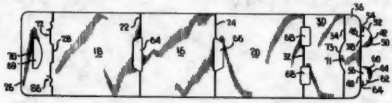
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ B65D *75/00*

U.S. Cl. 229—40 **8 Claims**

1. For use in a carton lock of the type including a male locking tab joined to such carton by a narrow neck and having a locking shoulder on one side of said neck, an improved lock including a female slot arrangement formed in said carton for receiving the male locking tab, said female slot arrangement comprising a single linearly continuous first cut line including

a straight line portion terminating in a reversing portion defining a locking ear, and a second cut line intersecting said first



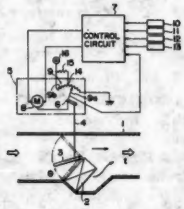
cut line at an adjacent side of said ear and extending away from said straight line portion wherein said ear is free to deflect.

4,611,755

AUTOMOBILE AIR CONDITIONER SYSTEM WITH IMPROVED TEMPERATURE CONTROL DEVICE

Choshichi Miyanaga, Higashi-Matsuyama; Yoshihiko Sakurai, Konan; Katsumi Iida, Konan, and Akihiro Hagiwara, Konan, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,027
Claims priority, application Japan, Nov. 19, 1984, 59-175269
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—13 **2 Claims**



1. An automobile air conditioner system including an air-mix door for adjusting the temperature of air blown-off from the air conditioner system, and a temperature control device having a potentiometer including a movable contact movable in unison with said air-mix door and a resistance element along which said movable contact slides for detecting the opening amount of said air-mix door, said temperature control device comprising at least one tap disposed between opposite ends of said resistance element, and an auxiliary resistance connected at its one end with said tap and disposed parallel to said resistance element.

4,611,756

CONTROLLER FOR FAN MOTOR OF AIR CONDITIONER

Toshio Ohashi, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 27, 1984, Ser. No. 686,703
Claims priority, application Japan, Dec. 29, 1983, 58-251427
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49 **10 Claims**

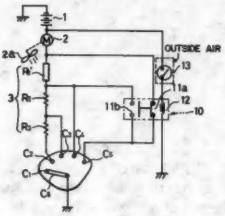
1. A controller for a fan motor of an air conditioner in a vehicle in which the fan motor drives a blowing fan to send air into a room of the vehicle, comprising:

adjusting means for changing the revolution of the motor to adjust the magnitude of a stream of air sent from the fan in a range from a powerful stream of air to a weak stream of air;

detection means for sensing a temperature of the air outside the room;

control means for reducing the magnitude of a stream of air from the fan when said detection means detects that the temperature of the outside air falls down below a predetermined temperature; and

a resistance element having a positive temperature characteristic interposed between said fan motor and a power



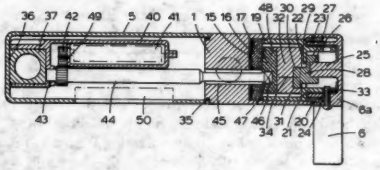
supply, said resistance element being exposed to air circulated by said fan.

4,611,757

MIXING DEVICE FOR MIXING TWO FLUIDS, ESPECIALLY HOT AND COLD WATER

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S, Vanvikan, Norway

Filed Jul. 11, 1984, Ser. No. 629,593
Claims priority, application Norway, Aug. 30, 1983, 833107
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.12 **8 Claims**



1. A mixing valve for mixing two liquids having different temperatures and for controlling the volume and temperature of the mixed liquids, said mixing valve comprising:

a valve housing having two inlets for the supply of the two liquids and an outlet for the discharge of the mixed liquids;

a fixed valve disc fixed on said housing and having two inlet apertures aligned with said inlets and an outlet aperture aligned with said outlet;

a movable valve disc mounted against said fixed valve disc for rectilinear and rotary movement relative thereto, said movable valve disc having therein a recess confronting said fixed valve disc and connecting said inlet apertures;

a handle mounted on said housing for rotation relative thereto;

means operably connected between said handle and said movable valve disc, for, upon rotation of said handle relative to said housing, controlling the volume of mixed liquids discharged through said outlet by moving said movable valve disc rectilinearly between a first volume control position, whereat said recess connects said inlet apertures to said outlet aperture thereby discharging the mixed liquids through said outlet, and a second volume control position, whereat said recess is out of communication with said outlet aperture and thereby discharge of the mixed liquids through the outlet is blocked;

an electric motor mounted on said housing and having a rotatable output member; and

means, operably connected between said output member and said movable valve disc, for, upon rotation of said output member selectively in opposite directions, controlling the temperature of the mixed liquids discharged through said outlet by rotating said movable valve disc in opposite directions to cause said recess to increase or decrease the

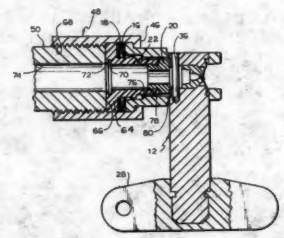
relative cross-sectional areas of said inlet apertures connected to said outlet aperture.

4,611,758

REVERSIBLE SPRAY TIP

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Continuation-in-part of Ser. No. 451,926, Dec. 21, 1982, Pat. No. 4,508,268. This application Jul. 26, 1984, Ser. No. 634,706
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.[4] B05B *15/02*
U.S. Cl. 239—119 **11 Claims**



1. A spray nozzle for use with a spray device adapted for hydraulically atomizing and spraying liquids, the spray device having a fluid passageway communicating with conduit means connected to a source of liquid under pressure and a sealing face abutting said spray nozzle, said spray nozzle including:

a. a housing having a first axial bore communicating with the fluid passageway of said spray device and a second cylindrically shaped transverse bore intersecting said first axial bore;

b. a cylindrical member mounted for rotational movement in said cylindrically shaped transverse bore of said housing, said cylindrical member having a diametric bore therethrough communicating with said first axial bore of said housing and terminating in a spray opening;

c. a first sealing member in said first axial bore of said housing having an axial fluid bore therethrough communicating between the fluid passageway of said spray device and the diametric bore in said cylindrical member, the outlet end of said sealing member having a shape complementary to said cylindrical member and being in sealing engagement therewith;

d. a second sealing member including a resilient sealing washer disposed between said housing and the sealing face of said spray device;

e. means engaging said first sealing member with said cylindrical member to prevent transverse movement of said cylindrical member in said housing which includes an annular undercut provided in said cylindrical member which mates with the complementarily shaped outlet end of said first sealing member thereby preventing transverse movement of said cylindrical member;

f. means for securing said nozzle to said spray device and effecting sealing therebetween;

g. means for rotating said cylindrical member; and

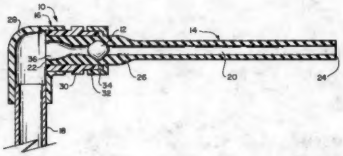
h. an undercut in the internal sidewall of said resilient sealing washer forming an annular skirt therein abutting the sealing face of said spray device.

4,611,759

NOZZLE

James P. Cox, 246 E. Bartlett Rd., Lynden, Wash. 98264

Continuation-in-part of Ser. No. 336,762, Jan. 4, 1982, abandoned. This application Apr. 26, 1983, Ser. No. 488,675
Int. Cl.[4] B05B *3/00*
U.S. Cl. 239—229 **9 Claims**



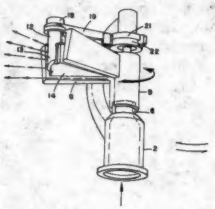
1. A nozzle for expelling a fluid stream in a dynamically variable pattern comprising a resiliently flexible tube having a bore, a proximal end, a distal end and an effective length at least equal to one harmonic wavelength of a coupled fluid stream for flexural resonant vibration of said tube as said stream is conducted therethrough, wherein said proximal end includes an enlarged, plastically deformable shoulder region for radial distension upon passage of particulate matter having a dimensional aspect greater than the bore dimension of said tube.

4,611,760

ROTARY IRRIGATION SPRAY DEVICE

Peretz Koresh, Galil Elyon, Israel, assignor to Dan Mamtirim, Galil Elyon, Israel

Filed Sep. 25, 1984, Ser. No. 654,146
Claims priority, application Israel, Oct. 3, 1983, 69887
Int. Cl.[4] B05B *3/14*
U.S. Cl. 239—233 **4 Claims**



1. A rotary irrigation spray device comprising irrigation coupling means for fixed mounting on an irrigation riser;

a spray discharge member rotatably mounted with respect to said coupling means so as to receive an upward, axially directed irrigation flow from said riser;

a wall portion of said spray discharge member having defined therein a substantially axially directed discharge outlet for a transversely directed discharge of said spray;

a pair of transversely directed walls extending integrally from said discharge member on either side of said discharge outlet;

a central member, located between said walls and substantially coextensive therewith and pivotally mounted, at an end thereof remote from said discharge outlet with respect to said transversely directed walls so as to be pivotally displaceable between said walls between a pair of positions so as to define with said walls a pair of angularly directed spray outlet paths which alternatingly communicate with said discharge outlet and which are eccentrically directed with respect to said axially directed flow;

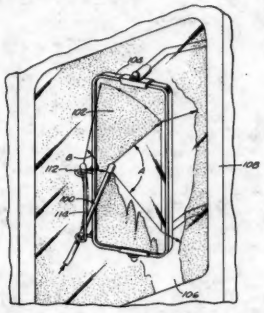
a deflecting means coupled to said central member so as to be pivotally displaceable therewith between a pair of

angularly spaced apart abutments fixedly mounted with respect to said coupling means, the arrangement being such that successive contact of said deflecting means with said abutments causes the successive displacement of said central member into one or other of its positions.

4,611,761
FLEXIBLE SPRAY WAND

Stephen L. Pollard, 27703 Ortega Hwy. #14, San Juan Capistrano, Calif. 92675

Continuation-in-part of Ser. No. 543,280, Oct. 19, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,174
Int. Cl.⁴ B05B *1/10, 3/00*
U.S. Cl. 239—284 R **5 Claims**



1. In a vehicle having a rearview mirror and side glass in proximity to the driver's seat, the improvement comprising cleaning means for cleaning the viewing surface of said rearview mirror and side glass comprising:

a source of air pressure,

a source of cleaning fluid,

a dispensing means positioned in proximity to said viewing surface,

means for conveying a stream of pressurized air and cleaning fluid from said sources to said dispensing means,

wherein said dispensing means comprises a flexible wand affixed at one end and having at least one orifice therein at approximately its free end, said wand being adapted when internally pressurized to bend in an arc about its fixed end whereby fluid is dispensing onto said viewing surface in an upward sweep causing the fluid to strike a larger area of said viewing surface, said wand being so disposed with respect to said viewing surface of said rearview mirror and said side glass that the fluid, when dispensed, first strikes the viewing surface of the rearview mirror and then is deflected in substantial part onto said side glass.

4,611,762
AIRLESS SPRAY GUN HAVING TIP DISCHARGE RESISTANCE

James J. Turner, and Joseph C. Waryu, both of Amherst, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 26, 1984, Ser. No. 665,028
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 239—708 **8 Claims**

1. A spray gun for electrostatically coating a substrate with an atomized liquid, comprising:

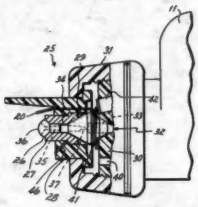
a spray gun body having a passage therethrough for conveying a liquid coating material which is under pressure;

a spray nozzle on the gun body through which coating material can issue in an atomized spray, including an electrically conductive tip;

an electrode carried by the spray nozzle having a portion extending from the spray nozzle for generating an electrostatic field to charge the atomized coating material, the electrode being positioned to be electrically isolated from the conductive tip in the spray nozzle;

electrical circuit means for coupling a high voltage to the electrode; and

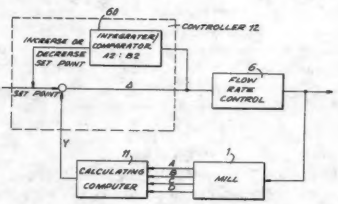
at least one resistive element mounted in the nozzle having a first end portion proximal to, and electrically coupled via a path which excludes said liquid to, the electrically conductive tip, and having a second free end portion free of electrical connection to a source of fixed electrical potential, said second end portion being located distal from both the electrically conductive tip and said electrode to minimize arcing when an object at a potential substantially different from that of said conductive tip approaches said nozzle at a point closer to said second free end position than to said conductive tip and/or electrode.



4,611,763
METHOD AND APPARATUS FOR CONTROLLING A GRINDING MILL

Hiroshi Tomiyasu; Masahiro Hattori, both of Yokohamashi, and Yoshio Itoh, Ichiharashi, all of Japan, assignors to Sankyo Dengyo Co. Ltd., Japan

Continuation-in-part of Ser. No. 377,967, May 13, 1982, abandoned. This application Aug. 10, 1984, Ser. No. 639,350
Claims priority, application Japan, May 27, 1981, 56-80508
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—30 **7 Claims**



1. A method for automatically controlling a grinding mill in a mill arrangement, the mill arrangement including a grinding mill, a raw material feed apparatus for feeding raw material into the mill at an adjustable rate, and a controller, wherein at least one signal indicative of a condition of the mill is input to the controller and compared to a controller set point in order to generate an output signal based on the comparison and wherein the output signal is input to the raw material feed apparatus to adjust the rate at which raw material is fed into the grinding mill, said method comprising the steps of:

(1) integrating the output signal of the controller for a predetermined time to obtain a first integrated quantity;

(2) automatically varying the controller set point a predetermined fixed amount in one of two directions from a set value, thereby generating a second controller output signal;

(3) integrating the second controller output signal for said

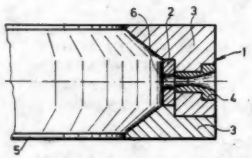
predetermined time, thereby obtaining a second integrated quantity;
(4) comparing the first integrated quantity with the second integrated quantity;
(5) automatically varying the controller set point a predetermined fixed amount in one of said two directions, which direction is determined by which of said first and second integrated quantities is greater, thereby generating a third controller output signal;
(6) integrating the third controller output signal for said predetermined time, thereby obtaining a third integrated quantity;
(7) redesignating said second and third integrated quantities as first and secind integreated quantities respectively;
(8) continuously repeating steps (4) through (7); and
(9) adjusting the rate at which raw material is fed into the mill based upon said output signal generated in step (5).

4,611,764

CRUSHING EQUIPMENT WITH AIR-JET, IN PARTICULAR FOR CRYSTALLINE MATERIALS

József Harsányi, and János Papp, both of Budapest, Hungary, assignors to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Jan. 10, 1984, Ser. No. 569,736
Claims priority, application Hungary, Jan. 12, 1983, 90/83
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—39 **1 Claim**



1. Crushing equipment, in particular for the comminution of crystalline materials, comprising: a cylindrical grinding chamber, at least one nozzle having an outlet opening leading into said chamber for introducing into said chamber a fluid under pressure, a crown carrying said nozzle and being composed of two releasably interconnected crown halves, and an exchangeable wear ring protecting said outlet opening, from material in the chamber, said two crown halves forming a seat for the exchangeable wear ring.

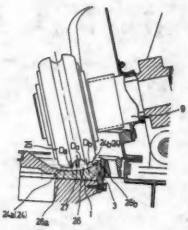
4,611,765

ROLLER MILL

Katsuhiko Shimojima; Masaki Hamaguchi, both of Kobe; Hiroshi Obana, Narashino; Takemi Aizawa, Funabashi, and Hiroyuki Ninomiya, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Onoda and Kabushiki Kaisha Kobe Seikosho, Kobe, both of, Japan

PCT No. PCT/JP84/00334, § 371 Date Feb. 28, 1985, § 102(e) Date Feb. 28, 1985, PCT Pub. No. WO85/00302, PCT Pub. Date Jan. 31, 1985
PCT Filed Jun. 28, 1984, Ser. No. 709,030
Claims priority, application Japan, Jun. 30, 1983, 58-120844; Jun. 30, 1983, 58-120845; Oct. 13, 1983, 58-193003
Int. Cl.[4] B02C *15/00*
U.S. Cl. 241—121 **6 Claims**

1. A roller mill, comprising:
a pulverizing table;
a roller shaft located in proximity to said table and having an end portion located above said table;
at least one pulverizing roller supported rotatably at said end portion of said roller shaft; and
means for pressing said pulverizing roller toward an upper surface of said pulverizing table, wherein raw material fed to said pulverizing table is pulverized by compression between said pulverizing table and said at least one pulverizing roller and wherein an outer peripheral surface of said at least one pulverizing roller is formed with at least one annular recess coaxial with said roller shaft and spaced from said upper surface of said pulverizing table wherein



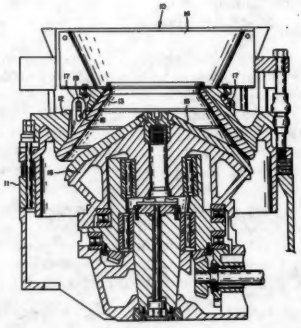
said outer peripheral surface of said at least one pulverizing roller and an upper surface of said pulverizing table form a gap having a wedge-like sectional shape which gradually decreases in sectional area toward an outside portion of the pulverizing table and form an outlet gap at a point of minimum sectional area.

4,611,766

RETAINER APPARATUS FOR RELEASABLY SECURING A BOWL LINER IN A ROCK CRUSHER

Dennis D. Seifert, Oregon City, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Jun. 26, 1985, Ser. No. 748,923
Int. Cl.[4] B02C *2/00*
U.S. Cl. 241—207 **1 Claim**



1. A rock crusher comprising a frame, a bonnet supported on said frame, said bonnet having a plurality of openings, a liner releasably fixed to said bonnet, said liner being generally frusto conical about a vertical axis and having an inner surface and an outer surface, a plurality of integral retainer loops extending upwardly from said liner outer surface and extending through said openings in said bonnet, each loop having an aperture extending generally horizontally therethrough, the aperture having a length extending generally perpendicularly to a radial plane passing through said each loop and axis, and wedge means extending through said loop aperture and engaging said bonnet on each side of said each loop to releasably secure said liner in place on said bonnet,
said aperture being defined by an upper wall that is arcuate in the direction of the length of said aperture, said upper wall having a center of curvature that is above said loop,

said wedge means including a wedge extending perpendicularly to said plane, and including an elongated contoured element having a longitudinally extending planar surface in engaging relation with said wedge and having an opposing longitudinally extending arcuate surface in mating engagement with said upper arcuate wall, said wedge being insertable from either side of said each loop with full surface bearing between said wedge and said contoured element and between said contoured element and said upper arcuate wall.

4,611,767

YARN WINDING APPARATUS WITH DOFFING MEANS

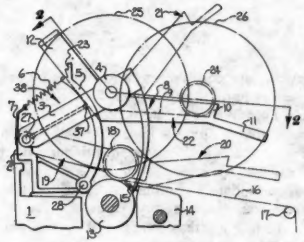
Detlev Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,413

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434871

Int. Cl.[4] B65H *54/42, 54/553, 49/26*

U.S. Cl. 242—18 DD 16 Claims



1. A yarn winding apparatus for winding a yarn onto a rotating bobbin tube, and comprising

a package drive roll mounted for rotation about a fixed drive axis,

a U-shaped package holder comprising a pair of spaced apart parallel arms defining a winding axis therebetween,

a pair of package mounting discs,

means rotatably mounting said discs to respective ones of said arms of said package holder so as to be adapted to mount a bobbin tube along said winding axis and between said arms,

means mounting said package holder for pivotal movement about a pivot axis which is parallel to said drive axis and said winding axis, and such that a bobbin tube mounted between the arms of said holder is adapted to contact and move away from said drive roll as the package builds,

a pair of guide tracks mounted to respective ones of said arms of said package holder for pivotal movement about an axis parallel to or coincident with said winding axis, and for movement between a winding position, and a doffing position wherein the guide tracks are disposed under the ends of a bobbin tube mounted on said package holder and said tracks are inclined slightly downwardly in a direction extending away from said winding axis, and

control means for axially separating said mounting discs to release a full package supported therebetween, and such that said guide tracks are adapted to be positioned in said doffing position and the full package released to fall onto said guide tracks and roll to a desired position.

4,611,768

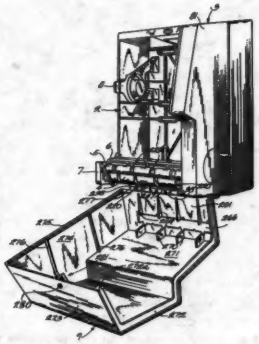
MODULAR PAPER TOWEL DISPENSER

Thomas C. Voss, Green Bay; Delos P. Lesperance, DePere, and Myron F. Lindeman, Green Bay, all of Wis., assignors to Mosinee Paper Corporation, Mosinee, Wis.

Filed Jul. 1, 1985, Ser. No. 751,336

Int. Cl.[4] B65H *16/00, 16/02*

U.S. Cl. 242—55.3 14 Claims



1. A paper towel dispenser cabinet comprising, in combination:

(1) a molded plastic back including a rear wall, spaced top and bottom walls, and spaced first and second side walls;

(2) a molded plastic door including a front wall having opposed first and second edge portions, spaced top and bottom walls extending from the front wall, and a first side wall extending from the first side edge portion of the front wall,

the door being hingedly connected to the back;

(3) a mechanism module including a molded plastic inner member and a molded plastic outer member forming a housing for operating mechanism for the dispensing of paper towel from the cabinet,

the mechanism module being secured to the back with the outer member thereof coplanar with and extending from the second side wall of the back;

(4) the back, door and mechanism module forming a cabinet enclosure for the storage of paper towels wherein, with the door closed, the top and bottom walls of the door and the back form the top and the bottom of the enclosure, the first side wall of the door and the first side wall of the back form one side of the enclosure, and the second side wall of the back and the outer member of the mechanism module form an opposite side of the enclosure.

4,611,769

SLITTING AND REWINDING MACHINE

Peter Orbach, Lindlar, Fed. Rep. of Germany, assignor to Firma Kampf GmbH & Co. Maschinenfabrik, Mühlen, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,167

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418741

Int. Cl.[4] B65H *19/20, 47/02*

U.S. Cl. 242—56.9 12 Claims

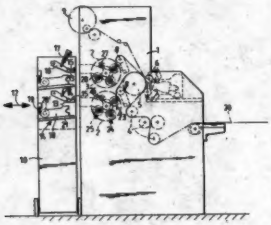
1. A slitting and rewinding machine for a web to be slit into a plurality of strips, comprising two turnstyles for the reception of a plurality of winding shafts, which can be brought, by turning of the specific turnstyle, one after the other, into different working stations, such as unloading station, loading station, at least one rewinding station, and which receive in a clampable manner, winding cores, and further comprising a loading carriage for the supply of empty winding cores and for the

reception of the finished rolls, characterized by the following features:

(a) each winding shaft within a turnstyle is supported on one end in a drive frame of a drive plate;

(b) the other end of each winding shaft is beared rotatable in a support frame of a bearing plate;

(c) the support frames are movable on an axial guide of a carrying tube;



(d) one sliding device for the support frame with the respective winding shaft is associated respectively with the unloading station and the loading station;

(e) a loading carriage comprises on the one side a roll case and on the other side a core case for each turnstyle and is movable, transversely to the axis of the turnstyle, to the loading station and the unloading station, respectively.

4,611,770

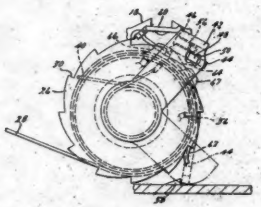
AUTOMOTIVE SEAT BELT RETRACTOR WITH ANTI-CINCH DEVICE

Patrick J. Cotter, Plymouth Township, Wayne County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 30, 1985, Ser. No. 739,400

Int. Cl.[4] B60R *22/34*

U.S. Cl. 242—107.4 D **8 Claims**



1. A retractor mechanism for a motor vehicle seat belt of the automatic locking type having a pawl means selectively lockingly engageable with ratchet means upon certain retraction of the belt from a protracted position selected by a user of the belt, the retractor mechanism including a frame portion, a belt take-up reel assembly operatively mounted on the frame portion through a spool member and having friction clutch means operatively engaged therewith, characterized in that an anti-cinch device is provided for permitting certain movement of the belt while locking engagement of the pawl and ratchet is effected, the device comprising:

a saddle member rotatively mounted on the spool member and engageable with the clutch means for limited rotation therewith,

a pawl member mounted on the saddle member for selective engagement with the ratchet means, and including a spring member carried with the saddle member in engagement with the pawl member to urge the pawl member toward engagement with the ratchet means,

tie bar means mounted on the frame for limiting rotative saddle movement in one direction,

and frame stop means for limiting rotative saddle movement in the other direction.

4,611,771

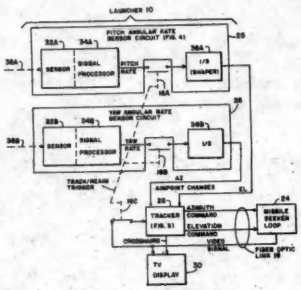
FIBER OPTIC TRACK/REAIM SYSTEM

John P. Gibbons, and Rex B. Powell, both of Huntsville, Ala., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,432

Int. Cl.[4] F41G *7/32*

U.S. Cl. 244—3.12 **9 Claims**



1. In a missile system wherein a missile is launched from a movable housing and directed toward a target, a missile guidance method comprising the steps of:

launching a missile along a selectable path,

generating azimuth and elevation guidance commands for said missile at a tracker station on said movable housing,

guiding said guidance commands along a confined optical path from the tracker station to the missile,

optically imaging a selectable field of view along and adjacent to said path ahead of said missile,

guiding a video signal of said optical imaging from said missile to said tracker station along said confined optical path for providing selectable missile azimuth and elevation guidance signals to the tracker,

directing said video signal to a video display on said movable housing for providing a visual image of optically imaged scenes,

measuring the angular rate of movement of said movable housing for providing azimuth and elevation signals indicative of changes in direction of movement of said tracker and said video display,

coupling the azimuth and elevation signals obtained from the measured angular rate of movement as a selectable input to said tracker station, and

controllably switching between said video signal azimuth and elevation input signals to the tracker station and said angular rate azimuth and evaluation input to the tracker station for controlling said generating of azimuth and elevation guidance commands.

4,611,772

METHOD OF INCREASING THE EFFECTIVENESS OF TARGET-SEEKING AMMUNITION ARTICLES

Lothar Stessen, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,573

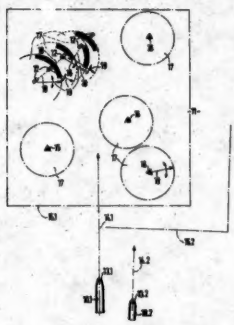
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343259

Int. Cl.[4] F41G *7/22*

U.S. Cl. 244—3.16 **3 Claims**

1. In a method for increasing the effectiveness of the utiliza-

tion of target-seeking ammunition articles, including a sensor in each said article for scanning a pregiven searching surface within a target area pursuant to predetermined target criteria; the improvement comprising: effecting a search for a further neighboring target possessing said preselected target criteria



upon detection of a first target possessing said predetermined target criteria within pregiven target surroundings about said first target; and upon detecting of a pregiven number of such neighboring targets possessing said predetermined target criteria, homing said article onto one of said targets.

4,611,773

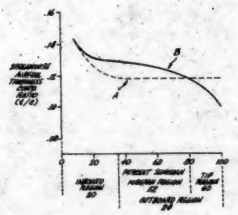
TAPERED THICKNESS-CHORD RATIO WING

Mark I. Goldhammer, and Armand Sigalla, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 454,588, Dec. 30, 1982, abandoned. This application Dec. 27, 1984, Ser. No. 685,970

Int. Cl.[4] B64C *3/10*

U.S. Cl. 244—35 R **8 Claims**



1. A tapered ratio wing suitable for use by aircraft designed to travel at subsonic and transonic speeds, said tapered ratio wing including an upper surface and a lower surface, said upper and lower surfaces defining an airfoil having a leading edge and a trailing edge, said airfoil having a cross-sectional configuration that defines a thickness and a chord length, both the thickness and chord length of the cross-section of said airfoil continuously decreasing from the root of said wing to the tip thereof, the ratio of said thickness to said chord length of said cross-sections of said airfoil also continuously decreasing from the root of said wing to the tip thereof, the outboard region of said tapered ratio wing being tailored to prevent the unsweeping of spanwise oriented isobars that are produced when the wing moves through the air at transonic speeds.

4,611,774

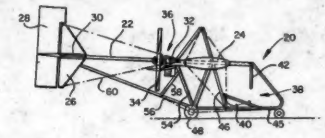
PROPELLER DRIVE ASSEMBLY

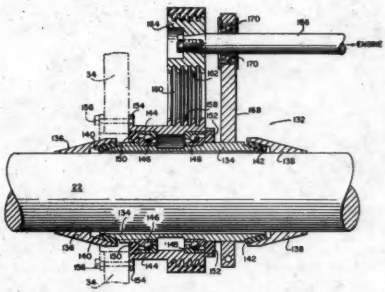
Rolf Brand, 212 N. Mecklenburg Ave., South Hill, Va. 23970

Continuation-in-part of Ser. No. 403,697, Jul. 30, 1982, Pat. No. 4,500,053. This application May 10, 1984, Ser. No. 608,670

Int. Cl.[4] B64C *1/16*

U.S. Cl. 244—54 **21 Claims**





1. An assembly for mounting a propeller, which is driven by an aircraft engine, on a longitudinal member of an aircraft comprising:

a sleeve having first and second ends and positioned about said longitudinal member,

a securing means for securing said sleeve relative to said longitudinal member so that said sleeve does not move longitudinally along said longitudinal member,

said securing means including opposed first and second cups operatively attachable, respectively, to said first and second ends of said sleeve,

a rotating means mounted to said propeller, rotatable about said sleeve, and driven by said engine for rotating saod propeller concentrically about a longitudinal axis of said longitudinal member, and

a bearing means disposed between said rotating means and said sleeve and on which said rotating means rotates.

4,611,775

RAILWAY TRACK SWITCH CONTROL APPARATUS

William A. Petit, Spencerport, N.Y., assignor to General Signal Corp., Rochester, N.Y.

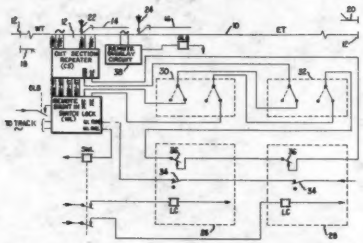
Filed Dec. 29, 1983, Ser. No. 566,855

Int. Cl.[4] B61L *19/06*

U.S. Cl. 246—28 F **11 Claims**

1. Apparatus for unlocking a track switch, said track switch providing an unlocking request output when an unlocked condition is requested, said track switch being disposed adjacent a section of main tracks having successive sections separated by insulated joints to enable a train to move between said main tracks and secondary tracks, a repeater connected to said main tracks on opposite sides of the one of said joints for said section which has said track switch adjacent thereto for receiving and transmitting track codes representing the presence and lack of train occupancy in said section for controlling wayside signals, said apparatus comprising switch lock means including microprocessor means, said switch lock means being con-

nected in controlling relationship with said track switch and said repeater, said microprocessor means having means for vitally checking its operation for enabling said microprocessor means to provide outputs for enabling the unlocking of said track switch and said repeater for the transmission of signals operative to clear said wayside signals only in the absence of a failure of said microprocessor means, said microprocessor means also having means responsive to said unlocking request output for inhibiting said repeater from the transmission of the track codes operative to clear said wayside signals, said microprocessor means further having means responsive to said track occupancy signals from said repeater indicative of the lack of occupancy and to said unlocking request output for generating the unlocking enabling output, said switch lock means having vital driver means for generating signals for enabling said repeater and unlocking said track switch, and means interfacing said vital driver means and said microprocessor means for providing said unlocking enabling and transmission enabling outputs to said vital driver means and for controlling said microprocessor means.

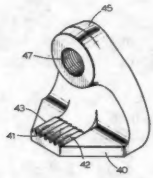


4,611,776

ROLLER CLAMP FOR ENGINE TEST STAND

William J. Williams, 2731 Pawnee Dr., Indianapolis, Ind. 46229

Filed Mar. 30, 1983, Ser. No. 480,266
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—228 9 Claims



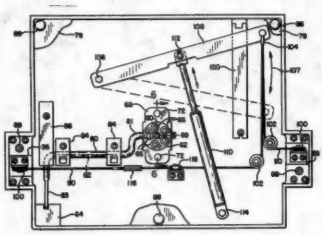
1. A roller clamp assembly comprising:
a housing having two rollers thereon having parallel rotational axes and arranged in tandem;
a pair of clamp jaws located between said rollers;
a jaw mounting bolt mounted in said housing and having a longitudinal axis parallel to said rotational axes and located between said rollers,
said jaws being threaded onto portions of said bolt, said jaws having teeth on upper faces thereof to grip the underside of a rail on which the rollers are to run, said teeth being oriented in a direction parallel to said rotational axes, the area covered by said teeth on a jaw extending only a short distance in a direction perpendicular to said axes, said distance being no greater than seventy five percent of the radius from the bolt axis to the point on the teeth closest to the bolt axis.

4,611,777

COMPUTER TERMINAL STAND

Thomas M. Ireland; Thomas J. Koller, both of West Linn, and Michael T. Lancaster, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

PCT No. PCT/US83/01589, § 371 Date Oct. 15, 1984, § 102(e) Date Oct. 15, 1984, PCT Pub. No. WO85/01648, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 11, 1983, Ser. No. 662,607
Int. Cl.[4] B60N *1/02*
U.S. Cl. 248—371 18 Claims



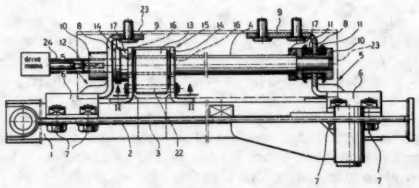
1. A stand for an electronic instrument having a light display, comprising:
a base member for supporting the stand, including swivel means to enable said stand to swivel in a substantially horizontal plane;
telescoping post means attached to said base member including an inner post member and an outer post member which slide relative to each other to enable height adjustment of the post means;
a support carriage for supporting the instrument thereon;
a tilt connector means for pivotally attaching said support carriage to said telescoping post means to enable said carriage to tilt in a substantially vertical direction; and
cylinder means attached to said base member for maintaining the post means in an adjusted height position after movement of the carriage on said post means to different height positions.

4,611,778

ADJUSTING DEVICE FOR VEHICLE SEATS

Heinz Werner, Remscheid-Hasten; Bernd A. Kluting, Radevormwald; Klaus D. Bertram, Remscheid, and Frantisek Svoboda, Erbrath, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,042
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420221
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 14 Claims



9. An adjusting device for vehicle seats, comprising:
a guide rail rigidly connected to a vehicle floor;
a slide rail connected to a vehicle seat and slidably arranged within the guide rail;

a threaded spindle rotatably attached to one of the guide rail and the slide rail;

a spindle nut threadably arranged on the threaded spindle and connected to the other of the guide rail and the slide rail such that the spindle nut can pivot with respect to the other rail along two perpendicular axes; and

wherein the spindle nut is provided with a continuous channel running parallel to a threaded bore which receives the threaded spindle, and which channel receives a bar in a non-sliding manner whereby said nut does not slide on said bar and which prevents a rotation of the spindle nut about the longitudinal axis of its threaded bore, and which has opposing boundary surfaces that cooperate with the bar and are spaced from each other such that at the midpoint in the length of the channel the intervening distance is equal to the thickness of the bar and toward the two ends of the channel this distance uniformly increases.

4,611,779

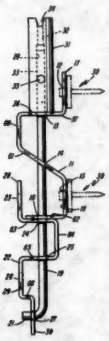
ADJUSTABLE OBJECT HANGER

Gustav Leonard, Jr., 4208 Braeburn Dr., Fairfax, Va. 22032

Filed Dec. 10, 1984, Ser. No. 679,923

Int. Cl.[4] A47G *1/24*

U.S. Cl. 248—476 **20 Claims**



1. An apparatus for adjustably and securely supporting an object having a substantially flat side from a load-bearing surface, comprising:

support means attached to said load-bearing surface for providing two fixed supports, one at each of two horizontally spaced positions on said load-bearing surface;

adjustable load transfer means, cooperating with said support means, for securely transferring therethrough the weight of said object at said supports to said load-bearing surface;

object support means, cooperating with said adjustable load transfer means, for securely transferring thereto the weight of said object, said object support means being attached to said substantially flat side of said object at locations that match said horizontally spaced positions of said supports; and

adjustment means, connected to said adjustable load transfer means, for adjusting the relative vertical juxtaposition of said object support means with respect to each of said supports individually, said adjustment means having the capacity for flexibly deforming said support means and said object support means at the user's option.

4,611,780

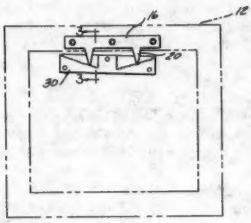
PICTURE HANGING ASSEMBLY

Larry M. Robertson, 1142 Mapleleaf Dr., Rochester, Mich. 48063

Filed Jun. 12, 1985, Ser. No. 744,032

Int. Cl.[4] A47G *1/24*

U.S. Cl. 248—477 **5 Claims**



1. A picture hanging assembly comprising

a first bracket having an elongated body and two prongs which extend outwardly from one edge of said body, said prongs being longitudinally spaced from each other and having a free end,

a second bracket having an elongated body and two recesses open to one edge of said second bracket body, each recess being dimensioned to slidably receive one prong, each recess having a bottom spaced from and facing said one edge of said second bracket body, said bottoms of said recesses being inclined with respect to the longitudinal axis of said second bracket body and so that said bottoms are inclined in opposite angular directions,

means for attaching one of said brackets to a picture, and

means for attaching the other of said brackets to a wall structure

wherein each prong has a length so that, with each prong positioned within its receiving recess and having its free end in abutment with the bottom of its receiving recess, said body of said first bracket is spaced from said body of said second bracket.

4,611,781

SUPPORT STAND IN PARTICULAR FOR HOLDING TREES TO BE PUT UP

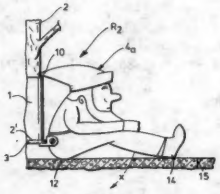
Martin Wiegand, Otto-Efferenstr. 38, 7712 Blumberg, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,446

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330463

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—526 **1 Claim**



1. A support stand for holding trees on a flat support structure which comprises: a sleeve for holding the tree having a lower portion and a hollow upper portion for receiving the stem of the tree; a bracket engaging the lower portion of said sleeve including hinge means comprising two plate members extending outwardly therefrom; a tongue portion extending

inwardly from said plate members and engaging said bracket; support legs connected to said hinge means having a lower portion bearing on said flat support structure and having an upper portion including tree holding means engaging said tree above said sleeve, said support legs connected to said hinge means be a screw-nut connection so that the support legs are movable in the direction (x), wherein said support legs being in the shape of a gnome seated on the support structure by way of its buttocks and its heel, said gnome having a pointed cap which is seated on the flat support structure with the pointed cap boring into the tree.

4,611,782

VIBRATION ISOLATING APPARATUS

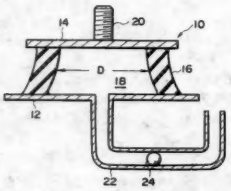
Takao Ushijima, Chigasaki, and Takeshi Noguchi, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,729

Claims priority, application Japan, Jun. 8, 1984, 59-117589; Jun. 27, 1984, 59-132673

Int. Cl.[4] F16M *1/00, 13/00*

U.S. Cl. 248—562 **27 Claims**



1. A vibration isolating apparatus for reducing vibrations from a vibration source, comprising:

(a) a vibration absorbing main body interposed between said vibration source and a vibration receiving portion, said main body having a hollow chamber and a portion thereof which is made of a resilient material;

(b) a fluid sealed in said hollow chamber in said vibration absorbing main body;

(c) a tube connected to said vibration absorbing main body in such a manner that one end of said tube is communicated with said hollow chamber, said tube having a small effective area; and

(d) a mass member disposed inside said tube and having a larger density than that of said fluid, whereby the mass moving inside said tube is increased such as to ensure the occurrence of a desired resonance of said fluid.

4,611,783

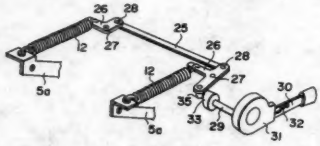
BODY-WEIGHT ADJUSTING DEVICE OF A SEAT SUSPENSION

Takao Sakamoto, Akishimashi, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,917

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—588 **3 Claims**



1. A body-weight adjusting device of a seat suspension comprising:

(a) a link means constituting said seat suspension;

(b) a pair of tension springs each being connected at one end thereof to one of the upper ends of said link means;

(c) a pair of rotatable bell cranks each being connected at one end thereof to the other end of each of said tension springs;

(d) a connecting rod rotatably connected to each of the other ends of said bell cranks;

(e) a pin means formed on one of said bell cranks such that it projects therefrom;

(f) a rotary shaft arranged substantially in a direction substantially parallel with said connecting rod;

(g) a control lever connected to said rotary shaft such that it is disposed in a direction substantially vertical to the axis of said rotary shaft; and

(h) a cam provided on said rotary shaft, said cam having an engaging surface such that movement of said cam surface against the pint results in a rotational movement of the bell cranks.

4,611,784

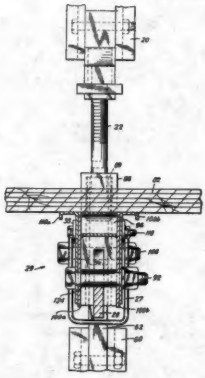
SAFETY LOCK FOR JUMP SCAFFOLDING

Anthony J. Gallis, Lake Hiawatha, N.J., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jan. 10, 1985, Ser. No. 690,156

Int. Cl.[4] E04G *11/06, 11/20*

U.S. Cl. 249—20 **14 Claims**



1. A self-actuating safety lock mountable on crane-liftable jump scaffolding for securing the latter to a projecting anchor affixed to the side of a poured concrete wall, comprising a support frame for said lock mountable on said jump scaffolding such that said lock is engagable with said anchor to position and support said scaffolding on said wall, engaging means mounted on said frame for interacting with said projecting anchor in a relative hooking support, a safety catch assembly being pivotally mounted on said frame to lockingly catch said projecting anchor in the at-rest position to prevent unhooking of said engaging means from said anchor and being pivotally rotatable to a lifted unlocked position, a lift connector attached to said safety catch assembly at a point offset from the pivot axis of the latter such that an upward lift derived from said crane acting on said connector rotates said assembly to its unlocked position, and fastening means for mounting said lock to said scaffolding.

4,611,785
TUBE CLOSURE DEVICE

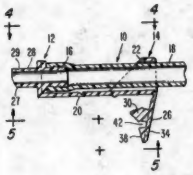
Peter L. Steer, Surrey, England, assignor to Craig Medical Products Limited, Reigate, England

Filed Nov. 19, 1985, Ser. No. 799,762

Claims priority, application United Kingdom, Dec. 6, 1984, 8430881

Int. Cl.⁴ F16L *55/14*

U.S. Cl. 251—4 **6 Claims**



1. A tube closure device for closing a flexible tube comprising:

(a) a first member having a tube portion for insertion into an end of said flexible tube;

(b) a second member hinged to said first member and having means for securing and supporting said flexible tube within a portin of said second member;

(c) latch means integrally connected to said securing and supporting means for releasably holding said first and second members in a hinged together "closed" position; and

(d) plug means integrally connected to said latch means for closing said tube portion of said first member in said closed position when said first member is folded to receive said plug means therein.

4,611,786
RADIATOR VALVE

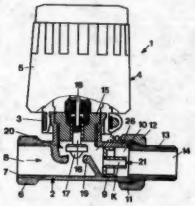
Hans Jorgensen; Iver S. Bertelsen, both of Nordborg, and Hans-Erik K. Jensen, Åbenrå, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Sep. 19, 1984, Ser. No. 651,920

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335741

Int. Cl.⁴ F16K *47/08, 1/52*

U.S. Cl. 251—118 **15 Claims**



1. A radiator valve assembly, comprising, inlet and outlet pipe sections, adjustable throttle valve and valve seat means between said sections, throttle insert means inserted into said outlet pipe section from the free end thereof, said insert means having a cylindrical external surface in sealing and retaining engagement with the internal surface of said outlet pipe section, said insert means having transversely extending wall means, said insert means forming elongated fixed throttle passage means extending through said wall means through which at least substantially all the fluid flow through the valve seat passes, said fixed throttle passage means having a converging cross section at the inlet side thereof and a remaining cross section which then remains substantially constant over the length thereof, said remaining cross section having a length greater than the transverse width thereof, the length of said remaining cross section being several times greater than the corresponding dimension of said wall means.

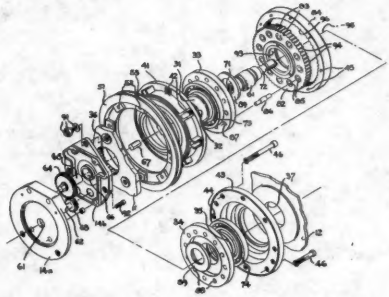
4,611,787
EFFICIENT LIGHTWEIGHT HOIST WITH MULTIPLE-CABLE-SIZE TRACTION AND SAFETY SYSTEMS

Marvin M. May; Robert C. Billings, both of Los Angeles; Harry A. Kendall, Granada Hills, and Jeffrey T. Bayorgeon, Walnut, all of Calif., assignors to Power Climber, Incorporated, Los Angeles, Calif.

Continuation of Ser. No. 508,074, Jun. 23, 1983, Pat. No. 4,555,091. This application Jun. 26, 1985, Ser. No. 735,191

Int. Cl.⁴ B66D *1/14, 1/30, 5/04;* F16H *1/28*

U.S. Cl. 254—267 **10 Claims**



1. An efficient, lightweight power transmission system for a hoist that has a housing and that is particularly adapted for raising and lowering a cable-suspended scaffold or the like along a cable; said system comprising:

a speed-reducing power transmission mechanism that is a self-contained independent module with respect to the remainder of the system and that has:

a transmission-mechanism case having a peripheral wall that encircles, and having two substantially opposed lateral walls that substantially enclose, the remainder of the transmission mechanism,

an input drive shaft rotatably mounted within the transmission-mechanism case,

mechanical means, within the case, connected to receive torque from the input drive shaft and to produce torque with an increased mechanical advantage and reduced speed;

an output drive shaft mounted within the case for rotation within the case and having a longitudinal extension that protrudes out of the case through at least one aperture in the lateral walls, said aperture being of substantially smaller areal extent than said lateral walls, said output drive shaft being connected to receive said torque with increased mechanical advantage and reduced speed from the said mechanical means, and in operation said output shaft rotating relative to the case,

the longitudinal extension to the output drive shaft being secured to, and fixed against rotation relative to, such hoist housing so that in use the case rotates relative to the hoist housing;

driving means, mounted to the housing, for applying torque to the input drive shaft of the transmission mechanism;

cable-driving means secured to and rotated by the case of the transmission mechanism, whereby the cable-driving means rotate relative to the hoist housing;

means for detecting excessive speed of the hoist relative to such cable;

means, responsive to the detecting means, for stopping the hoist relative to such cable when the detecting means detect excessive speed; and

manually operable means for actuating the hoist-stopping means regardless of hoist speed relative to such cable;

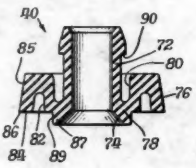
whereby a user can use the actuating means to halt the hoist relative to the cable in event of brake slippage that is not accompanied by complete brake failure, or in event operation of the drive means cannot be interrupted.

4,611,788

COMBINATION SEAT AND SEAL DEVICE

Jack W. Thomsen, LaGrange, Ill., assignor to Bruce J. Oliver, Las Vegas, Nev.

Division of Ser. No. 504,670, Jun. 15, 1983, Pat. No. 4,516,753.
This application Mar. 21, 1985, Ser. No. 714,567
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—363 **13 Claims**



1. An integral combination valve seat and seal device comprising:

a tubular portion including means defining a seat portion formed at one end of said tubular portion and an outwardly extending shoulder formed intermediate the ends of said tubular portion for retention of said device in a tubular structure;

an annular rim seal portion connected to said tubular portion at the end adjacent said seat portion;

sealing means formed on the outer periphery of said annular rim seal portion;

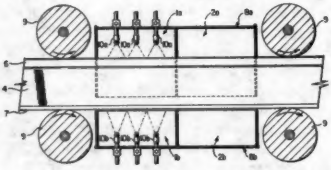
said sealing means including a generally axially extending sealing surface operable to coact with a surrounding cylindrical surface of a cooperating member.

4,611,789

APPARATUS FOR THE PRODUCTION OF IMPROVED RAILWAY RAILS BY ACCELERATED COOLING IN LINE WITH THE PRODUCTION ROLLING MILL

Robert J. Ackert; Robert W. Witty, and Peter A. Crozier, all of Sault Ste. Marie, Canada, assignors to The Algoma Steel Corporation Limited, Sault Ste. Marie, Canada

Division of Ser. No. 405514, Aug. 5, 1982, now Patent No. 4,486,284.
This application Nov. 28, 1984, Ser. No. 675,772
Claims priority, application Canada, Jul. 6, 1982, 406692
Int. Cl.[4] C21D *1/62*
U.S. Cl. 266—81 **14 Claims**



1. Apparatus for accelerated cooling of a railroad rail passing longitudinally through said apparatus from an initial temperature above the austenite to ferrite transformation temperature, to improve the metallurgical properties thereof by producing a metallurgical structure composed primarily of finely spaced pearlite in the rail head of the railroad rails, comprising:

(a) means for subjecting the head portion and the bottom surface of the base portion of the rail to intermittent forced cooling, in such a manner that the near surface region of the rail is maintained essentially above the martensite transformation temperature, said means comprising a series of cooling headers longitudinally spaced from one another by passive air zones of selected lengths, the cooling headers being operable to apply a liquid cooling medium to the rail thereby to afford a relatively high rate of cooling of the rail as it passes each of the cooling headers, the passive air zones being free of applied fluid thereby controlling the rate of cooling of said rail to a relatively low figure as it passes through each of the passive air zones;

(b) first baffle means for minimizing the cooling of the web portion and the top and side surfaces of tips of the base portion of the rail during the intermittent forced cooling;

(c) second baffle means for minimizing the cooling of the bottom surface of the tips of the base portion of the rail during the intermittent forced cooling;

(d) transport means for passing the rail longitudinally along the series of cooling headers and air zones such that the head portion and base bottom portion of the rail may be subjected to the liquid cooling medium; and

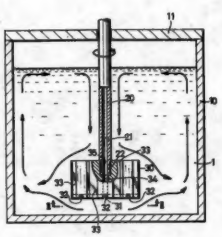
(e) control means for terminating the application of the liquid cooling medium when the head portion of the rail has reached a predetermined cooling stop temperature in the range of 850° F. to 1200° F., the control means including temperature monitoring means at the entry and exit ends of the apparatus.

4,611,790

DEVICE FOR RELEASING AND DIFFUSING BUBBLES INTO LIQUID

Ryotatsu Otsuka, Osaka; Shigemi Tanimoto, and Kazuo Toyoda, both of Izumi, all of Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Filed Mar. 21, 1985, Ser. No. 714,427
Claims priority, application Japan, Mar. 23, 1984, 59-57120
Int. Cl.[4] C22B *9/05*; B01F *3/04*
U.S. Cl. 266—235 **5 Claims**



1. A bubble releasing-diffusing device for releasing a gas into a liquid in the form of finely divided bubbles and diffusing the bubbles through the entire body of the liquid, comprising:

a rotary shaft to be disposed in the liquid substantially vertically and rotatable about its own axis, the rotary shaft having a gas channel extending therethrough axially of the shaft, and

a rotor fixed to the lower end of the rotary shaft and having at a bottom surface thereof a gas discharge outlet communicating with the gas channel, the rotor having radial grooves in the bottom surface thereof extending from the gas outlet to the peripheral surface of the rotor and each

having an open end at the peripheral surface, and a recess being formed in the peripheral surface of said rotor between the open ends of immediately adjacent grooves and having an open lower end at the bottom surface.

4,611,791

DIFFUSER SYSTEM FOR ANNEALING FURNACE WITH WATER COOLED BASE

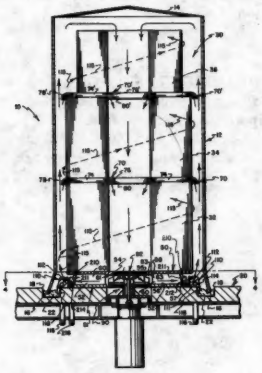
Gary L. Coble, 12065 Greenwick Rd., Homerville, Ohio 44234

Continuation-in-part of Ser. No. 456,823, Jan. 10, 1983, Pat. No. 4,516,758. This application May 9, 1985, Ser. No. 732,400

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] F27B *5/06*

U.S. Cl. 266—263 **13 Claims**



1. A convection diffuser and charge support system for an annealing furnace, comprising:

(a) a generally annular base structure having inner and outer portions that define substantially concentric circles that are radially spaced one from the other, the base structure being formed form at least one base structure casting, the base structure defining a bottom wall, a top wall, a plurality of curved vane structures that extend substantially vertically between the top and bottom walls to define an array of curved, substantially horizontally extending flow passage means which underlie and are shielded from above by the top wall of the base structure, with the top and bottom walls of the base structure being of generally annular configuration when viewed from above, and with the curved horizontally extending flow passage means having inner and outer openings near the inner and outer portions of the base structure for ducting gas flows along curved, radially-outwardly-directed paths that extend from the inner openings toward the outer openings;

(b) the base structure defining upwardly facing means extending in a common horizontal plane for receiving and supporting a charge of material to be annealed, which charge is generally annular in configuration when viewed from above;

(c) a base-encircling outer ring means separately formed from at least one relatively massive outer ring structure casting, the outer ring means being configured and disposed to surround peripheral portions of the base structure, the outer ring means defining an array of curved, upwardly opening flow passage means which cooperate with the horizontally extending flow passage means of the base structure for ducting gases that discharge from the horizontally extending flow passage means and for ducting such discharged gases upwardly along generally helical paths of flow about a charge of material which is positioned atop the base structure for annealing;

(d) at least one outer ring cooling conduit within the at least one outer ring structure casting for ducting cooling fluid therethrough, the outer ring cooling conduit being disposed in the at least one outer ring structure casting in non-obstructing relation to the curved, upwardly opening flow passage means;

(e) a base-encircling inner ring means separately formed from at least one ring structure element and being configured and disposed to surround peripheral portions of the base structure at a location between the horizontally extending flow passage means of the base structure and the curved, upwardly opening flow passage means of the outer ring means, and having a plurality of fin elements projecting therefrom into paths of flow that are followed by gases discharging from the horizontally extending flow passage means toward the curved, upwardly opening flow passage means; and,

(f) at least one inner ring cooling conduit connected to the fin elements for ducting cooling fluid therethrough to cool the fin elements.

4,611,792

HYDROSTATICALLY COMPRESSED ELASTOMERIC SHOCK ABSORBER SPRING AND METHOD FOR ITS MANUFACTURE

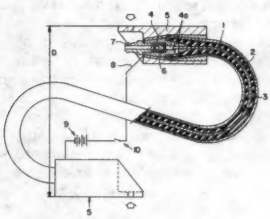
Jean Jarret, Paris, and Jacques Jarret, Louveciennes, both of France, assignors to Societe d'Exploitation des Ressorts Auto-Amortisseurs Jarret, Paris, France

Filed Aug. 1, 1983, Ser. No. 519,384

Claims priority, application France, Aug. 2, 1982, 82 13475

Int. Cl.[4] B28B *7/32;* **F01B** *29/10;* **F16F** *1/36*

U.S. Cl. 267—149 **4 Claims**



1. An improved hydrostatically compressed elastomeric shock absorber spring comprising:

(a) a casing of variable volume in the form of an elongated, bent deformable elastic tube having a flattened cross-section;

(b) an elastomer filling the elongated tube;

(c) regulating means for regulating the expansion of the elastomer in the elongated tube in accordance with the length of the spring, wherein the regulating means includes:

(i) a source of electric current,

(ii) an electrical current source switch,

(iii) means for detecting the length of the spring and controlling the switch, and

(iv) a heating resistor connected to the electric current source, buried in the elastomer, in the form of a central core along the elongated tube, having a flattened cross-section, and made of a flexible and electrically resistant material; and

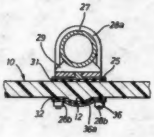
(d) two metal end-pieces fastened to the core for closing respective ends of said tube and for connecting the core to the source of electric current.

4,611,793

LEAF SPRING ASSEMBLY FOR WHEEL SUSPENSION

Kazuo Nishiyama; Yasuhiro Mishima, both of Toyota, and Kiyoaki Kuwayama, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Chuohatsujyo Kabushiki Kaisha, Aichi, both of, Japan

Filed Jun. 21, 1984, Ser. No. 623,198
Int. Cl.[4] B60G *11/02*; F16F *1/36*
U.S. Cl. 267—52 2 Claims



1. A leaf spring assembly comprising:

a longitudinal leaf spring made of fiber reinforced plastics having a first surface to be applied with a tension force and a second surface to be applied with a compression force, the first surface of said leaf spring being a flat surface, and the second surface of said leaf spring being provided with a protrusion located substantially at the central portion of said leaf spring, said protrusion being made of a number of laminated short fibrous sheet-like materials saturated with synthetic resin, said short fibrous sheet-like materials of said protrusion being laminated independently and separately from reinforcement fibrous sheet-like materials in said leaf spring;

a pair of pad members of elastic material attached to the first and second surfaces of said leaf spring;

a pair of retainer plates attached to the first and second surfaces of said leaf spring through said pad members, one of said retainer plates being formed with an indented portion coupled with the protrusion of said leaf spring through one of said pad members without any clearance to clamp said leaf spring at its central portion and being further provided with a pair of protruded portions which are arranged adjacent to the indented portion to retain said pad member in place by engagement therewith; and

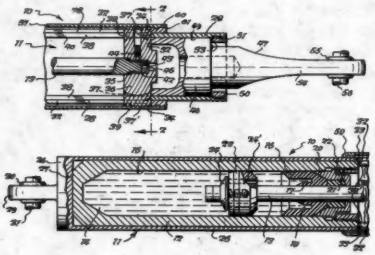
means for clamping said retainer plates to said leaf spring and mounting the same on an axle housing.

4,611,794

TENSION-COMPRESSION LIQUID SPRING UNIT

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,845
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—64.13 11 Claims



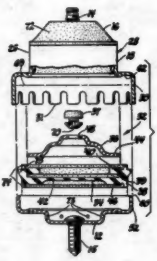
1. A liquid spring unit operable in both tension and compression comprising: a liquid spring including a cylinder, piston, compressible liquid in said cylinder, and liquid seal means between said piston and cylinder; a housing mounting said cylinder therein for slidable movement; first attachment means on said housing for attachment to a first structural member; second attachment means spaced from said first attachment means and mounted relative to said cylinder for attachment to a second structural member; first means supported by said housing for holding said cylinder against movement in a first direction when said first and second spaced attachment means are moved toward each other to cause said second attachment means to effectively engage said piston and cause said piston to move in said first direction into said cylinder to thereby provide a spring action in compression; and second means supported by said housing for holding said piston against movement in a second direction which is opposite to said first direction when said first and second spaced attachment means are moved away from each other to cause said cylinder to be moved in said second direction to thereby provide a spring action in tension.

4,611,795

HYDRAULIC-ELASTOMERIC MOUNT

Richard A. Muzechuk, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 461,612, Jan. 27, 1983, abandoned. This application Dec. 5, 1984, Ser. No. 678,356
Int. Cl.[4] F16M *5/00*; F16F *15/04*; F16L *55/04*
U.S. Cl. 267—140.1 3 Claims



1. A hydraulic-elastomeric mount comprising a pair of mounting means, a hollow elastomeric body operatively connecting said mounting means, an elastomeric diaphragm having a rim portion clamped to one of said mounting means between opposed annular clamping portions thereof so as to close said elastomeric body with one side of said diaphragm and form therewith a closed cavity, a rigid partition extending between said clamping portions and mounted in said diaphragm rim portion so as to be directly engaged and sandwiched thereby and clamped therewith to said one mounting means and divide said cavity into a primary hydraulic chamber enclosed by said elastomeric body and a secondary hydraulic chamber enclosed by said diaphragm, a liquid contained in said chambers, an orifice through said partition interconnecting said chambers so as to permit liquid in said primary chamber to flow at a restricted rate into said secondary chamber upon contraction of said primary chamber and in the opposite direction on expansion thereof to thereby provide a damping effect, said diaphrgm rim portion on said one side having an integral annular axially outwardly projecting bead with an axially outwardly facing face sealing portion extending along the length thereof that engages and complies to the associated annular clamping portion on said one diaphragm side on the clamping of said diaphragm rim portion and partition to said one mounting means to effect tight sealing between the chambers and atmosphere, said diaphragm rim portion on said one diaphragm side having an inwarding facing annular groove radially inward of said bead receiving the periphery of said partition so as to alone effect the clamped mounting of same

between said clamping portions and also tight sealing between said chambers, said diaphragm rim portion having integral inwardly projecting annular shoulders forming the sides of said groove of less effective compliance than said bead that are preloaded to a predetermined degree against said partition on the clamping of said diaphragm rim portion and partition to said one mounting means so as to not disturb said sealing while permitting limited substantially free reciprocal travel of said partition relative to said one mounting means below a predetermined vibration amplitude of said one mounting means relative to the other and preventing such travel above such amplitude so that flow through said orifice to effect damping does not occur until said predetermined vibration amplitude is exceeded.

3. A hydraulic-elastomeric mount comprising a pair of mounting means, a hollow elastomeric body operatively connecting said mounting means, an elastomeric diaphragm having a rim portion clamped to one of said mounting means between opposed annular clamping portions thereof so as to close said elastomeric body with one side of said diaphragm and form therewith a closed cavity, a rigid partition extending between said clamping portions mounted in said diaphragm rim portion so as to be directly engaged and sandwiched thereby and clamped therewith to said one mounting means and divide said cavity into a primary hydraulic chamber enclosed by said elastomeric body and a secondary hydraulic chamber enclosed by said diaphragm, a liquid contained in said chambers, an orifice member mounted for limited relatively free reciprocal travel in said partition in response to pressure thereon in said chambers, said orifice member having an orifice interconnecting said chambers so as to permit liquid in said primary chamber to flow at a restricted rate into said secondary chamber upon contraction of said primary chamber and in the opposite direction on expansion thereof the thereby provide a damping effect following relative travel of said orifice member, said diaphragm rim portion on said one side having an integral annular axially outwardly projecting bead with an axially outwardly facing face sealing portion extending along the length thereof that engages and complies to the associated clamping portion on said one diaphragm side on the clamping of said diaphragm rim portion and partition to said one mounting means to effect tight sealing between the chambers and atmosphere, said diaphragm rim portion having an inwardly facing annular groove receiving the periphery of said partition so as to alone effect the clamped mounting of same between said clamping portions and also tight sealing between said chambers, said diaphragm rim portion on said one diaphragm side having inwardly projecting annular shoulders radially inward of said bead forming the sides of said groove of less effective compliance than said bead that are preloaded to a predetermined degree against said partition on the clamping of said diaphragm rim portion and partition to said one mounting means so as to not disturb said sealing while permitting limited substantially free reciprocal travel of said partition relative to said one mounting means below a predetermined vibration amplitude of said one mounting means relative to the other and preventing such travel above such amplitude so that flow through said orifice to effect damping does not occur following relative travel of said orifice member until said predetermined vibration amplitude is exceeded.

4,611,796

AERODYNAMIC RETARDER

Larry W. Orr, King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Feb. 21, 1985, Ser. No. 704,309
Int. Cl.[4] B62D *35/00*; B60T *1/16*
U.S. Cl. 296—1 S **10 Claims**

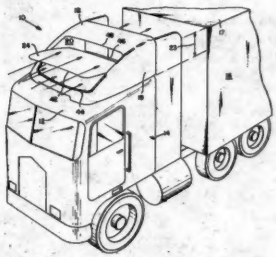
1. An aerodynamic retarding device for a tractor-trailer having a cab and a high rearward cargo compartment that extends upwardly above the cab, comprising:

an air-deflecting fairing mounted on top of the cab;

a door within said fairing covering an opening in the fairing that is the major frontal surface area of the fairing, movable relative to said fairing to an open position for exposing a large surface of the cargo compartment for creating aerodynamic drag and to a closed position to reduce drag;

a quick-acting actuating mechanism operatively associated with said door for rapidly opening and closing the door; and

means for energizing said actuating mechanism in response to a signal indicating the desire for braking of the tractor-trailer to open said door to expose the rearward cargo compartment when braking is desired and to close said door to deflect air over the cargo compartment when braking is not desired.



10. A method of aerodynamicaly retarding a vehicle having an operator's cab and a rearward, vertical cargo carrying compartment, said cab provided with a deflector for deflecting airflow around the rearward, vertical cargo carrying compartment, comprising the following steps:

selectively deflecting the airflow around the rearward, vertical cargo carrying compartment for decreasing drag;

selectively and rapidly creating an opening within the deflector for exposing the rearward, vertical cargo carrying compartment to the airflow for increasing drag; and

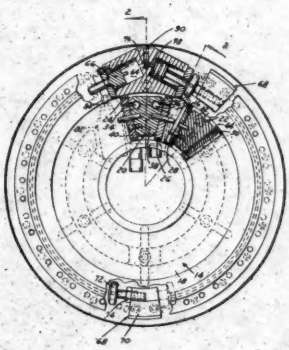
initiating said step of creating an opening responsive to braking demand on the vehicle.

4,611,797

FLUID-POWERED ROTARY TABLE

Robert Cetnarowski, 6080 Maple La., Pearl Beach, Mich. 48052

Filed Aug. 6, 1984, Ser. No. 637,749
Int. Cl.[4] B23Q *1/16*
U.S. Cl. 269—57 **18 Claims**



1. A fluid-powered rotary table comprising:

a base having a sealing surface parrallel to a plane;

a rotary housing having a sealing surface for cooperating with the sealing surface of said base, said rotary housing

being pivotably attached to said base and rotatable about a central axis perpendicular to said plane to define a toroid-shaped annular cavity;

a stationary block fixed to said base, projecting into said annular cavity and sealingly cooperating with said rotary housing;

a rotary block fixed to said rotary housing and projecting into said annular cavity sealingly cooperating with said base to divide said annular cavity into two separate fluid-tight annular segments whereby the rotation of the rotary housing relative to the base causes one annular segment to increase in volume and the other annular segment to correspondingly decrease;

fluid passage means for admitting and removing fluid from each of said annular segments for causing the rotation of the rotary housing relative to the base; and

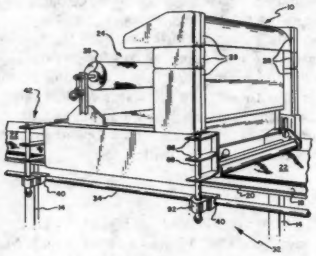
clockwise and counter-clockwise stop means to stop the rotation of the rotary housing relative to the base at variable predetermined annular clockwise and counter-clockwise orientations with at least one of said stop means being adjustable enabling the total travel of said rotary housing relative to the base to be varied.

4,611,798

CLOTH SPREADING APPARATUS

Michael E. Hoffman, Lockport, and Roy Stevenson, East Aurora, both of N.Y., assignors to Cutting Room Appliances Corp., Buffalo, N.Y.

Filed Dec. 3, 1985, Ser. No. 804,353
Int. Cl.[4] B65H *29/46*
U.S. Cl. 270—31 **8 Claims**



1. A cloth spreading apparatus for spreading superimposed layers of cloth on a plurality of tables which are connected together side by side, each table having a horizontal upper working surface and a front downwardly extending leg, the superimposed layers of cloth being subsequently cut; said apparatus comprising:

cloth laying machine at least partially supported on the working surface of a plurality of side-by-side tables for side-to-side traversing movement across the working surface of said tables, said cloth laying machine being capable of depositing a plurality of superimposed layers of cloth on the working surface of the tables as said cloth laying machine traverses the tables, said cloth laying machine including a frame having a front portion disposed adjacent a front edge of said tables; and

guide means for guiding said cloth laying machine as it traverses the tables to cause the superimposed layers of cloth to be in correct alignment with each other, said guide means including a plurality of cylindrical guide rods, aligning means aligning said guide rods in end-to-end relationship,

securing means rigidly securing said guide rods horizontally to the front legs of said tables and generally parallel to the front edge of said tables,

a pair of spaced apart horizontally disposed linear bearings mounted on said guide rods, and

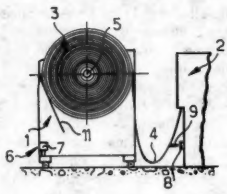
support means interconnecting said spaced apart horizontally disposed linear bearings with the front portion of the frame of said cloth laying machine.

4,611,799

PROCESS AND INSTALLATION FOR THE PRODUCTION OF DOCUMENTATION

Pierre Nuttin, 1289 Chaussée de Wavre, 1160 Brussels, Belgium

Continuation of Ser. No. 12,759, Feb. 16, 1979, abandoned. This application Jan. 22, 1981, Ser. No. 227,259
Int. Cl.[4] B65H *41/00*; B31B *1/26*
U.S. Cl. 270—52.5 **10 Claims**



1. A modular system for continuously producing business forms printed on a high-speed computer printer from a blank roll of paper comprising:

an independent first modular unit having means for supporting and controllably unwinding the roll of paper at a variable speed,

an independent second modular high-speed printing unit aligned with said first modular unit, said second modular unit being mechanically independent from said first modular unit and having means for accepting said paper, means for printing on said paper, and means for controllably pulling said paper through said second modular unit as it is required, said paper forming a first loop extending between said first and second modular units,

first means for monitoring the position of the bottom of said first loop, and

control means responsive to said said first monitoring means for causing said unwinding means to govern the speed of unwinding of said roll so that the roll is unwound whenever the first monitoring means senses that the bottom of said first loop moves above a predetermined level, whereby in response to the requirements of said second modular unit, said roll is unwound only by said unwinding means.

9. A modular system for continuously producing business forms printed on a high-speed printer from a blank roll of paper comprising:

an independent first modular unit having means for supporting and controllably unwinding the roll of paper at a variable speed and a feeler arm for sensing the diameter of the roll of paper;

an independent high-speed printing unit aligned with said first modular unit, said high-speed printing unit being mechanically independent from said first modular unit and having means for accepting, tightening and guiding said paper, means for printing on said paper, and traction means for controllably pulling said paper through the printing means as it is required, said paper forming a loop extending between said first modular unit and said high-speed printing unit,

means for monitoring the position of the bottom of said loop, said means including a photosensitive cell positioned on one of said first and second modular units and a light emitting element positioned on the other of said units, said elements being aligned with each other and being positioned on opposite sides of said first loop; and

control means responsive to the diameter of the roll sensed by the feeler arm and to said first monitoring means for

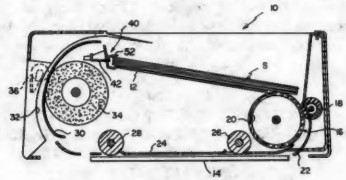
causing said unwinding means to govern the speed of unwinding of said roll so that the roll is unwound whenever the monitoring means senses that the bottom of said first loop moves above a predetermined level, whereby said roll is unwound in response to the needs of the high-speed printer but only by said unwinding means.

4,611,800

SHEET SEPARATOR APPARATUS FOR RECIRCULATING FEEDER

Michael H. Parsons, and James A. McGlen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,211
Int. Cl.[4] B65H 5/06
U.S. Cl. 271—3.1 4 Claims



1. In apparatus for circulating document sheets seriatim along a path leading from the bottom of a stack of such sheets to a copying position and then back to the top of the stack of sheets, the apparatus having a support for holding the stack of sheets, means for feeding the sheets along the path, a separator engageable with the sheet that initially is on top of the stack for separating sheets in the stack that have been circulated along the path from sheets in the stack that have not been circulated along the path, and means responsive to feeding of said top sheet along the path for returning the separator to the top of the stack, the improvement comprising:

means defining first and second spaced surfaces adjacent the support, a first portion of the separator being located between said surfaces and a second portion of the separator being adapted to rest on said top sheet;

drive means for applying a force to the separator to move the separator (1) in a first direction away from the support after the top sheet has been withdrawn from beneath the separator by the feeding means and (2) in a second direction toward the support when the top sheet has been returned to the top of the stack by the feeding means;

means defining a guide slot in said surfaces, a first portion of the slot being in the first surface and a second portion of the slot being in the second surface, the first slot portion having a ramp extending from the bottom of the first slot portion toward the second slot portion, and the second slot portion having a ramp extending from the bottom of the second slot portion toward the first slot portion; and

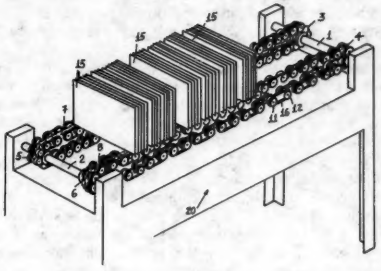
a guide pin mounted on the first portion of the separator and having end portions movable along the slot portions, the length of the pin being greater than the spacing between the surfaces and less than the distance between either of the surfaces and the bottom of the portion of the slot in the other surface, the pin being slidable relative to the separator toward and away from the bottoms of the slot portions in response to engagement between the end portions of the pin and the slot ramps during movement of the separator, the pin and slot cooperating during movement of the separator in the first direction to guide the second portion of the separator first away from the support and then upwardly, and the pin and slot cooperating during movement of the separator in the second direction to guide the second portion of the separator generally toward the support.

4,611,801

ACCUMULATING CONVEYOR DEVICE

Giorgio Pessina, and Aldo Perobelli, both of Via Timavo, 32, 30137 Paderno Dugnano (Milano), Italy

Filed Feb. 15, 1985, Ser. No. 702,148
Claims priority, application Italy, Mar. 22, 1984, 20197 A/84
Int. Cl.[4] B65H 1/02
U.S. Cl. 271—150 7 Claims



1. An accumulator conveyor device for simultaneously conveying and accumulating packs of signatures for feeding to a subsequent working stage, comprising a support structure;

a pair of horizontally disposed shafts carried by said support structure;

two pairs of sprockets, one pair carried by each said horizontally disposed shaft;

a pair of conveying chains each said chain being carried by a respective pair of said sprockets and being constituted by a plurality of articulated links pivotally connected by articulation pins, and

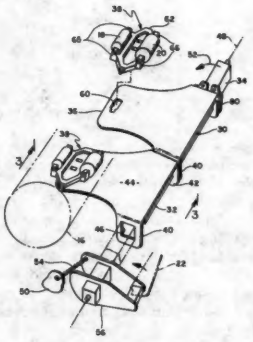
a plurality of pairs of pulleys, each said pair of pulleys being carried by a respective said articulation pin, said pulleys being interconnected in longitudinally adjacent pairs by loop members defining support surfaces for said packs of signatures.

4,611,802

PAPER FEEDER

Egon A. Pedersen, Diablo, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed Apr. 12, 1984, Ser. No. 599,397
Int. Cl.[4] B65H 5/06
U.S. Cl. 271—274 1 Claim



1. In a paper feeder which includes an elongated cylindrical platen rotatable with respect to the frame of the paper feeder,

the improvement of a pressure roller assembly for pressing paper against the platen comprising:

a shaft of noncircular cross-section mounted on said frame;

a plurality of leaf springs, each having a largely planar leaf portion, each leaf spring having an inner end mounted on said shaft, an outer end, and opposite sides; and

a plurality of roller assemblies, each including a mount and a pair of pressure rollers parallel to the axis of said platen, said mount being curved to permit rocking on an axis parallel to and midway between the axes of said rollers, each roller assembly mounted on the outer end of one of said leaf springs and with the leaf spring resiliently bent to press the rollers toward the platen;

each leaf spring having tabs at the opposite sides of its inner end which are bent at substantially right angles to said largely planar portion, each tab having a hole which receives said shaft closely enough to prevent rotation of the leaf spring on the shaft, and the tabs of adjacent leaf springs substantially abutting each other to fix the spacing of the rollers along the length of the platen wherein:

the outer end of each leaf spring has a slot;

the mount of each roller assembly has a lower surface that rests on a leaf spring, two pairs of upstanding arms each rotatably supporting a roller in rotation about an axis extending parallel to the length of the platen, and a pair of legs extending downwardly from its lower end and received in the slot of a leaf spring;

each leg has an enlarged lower end for engaging the leaf spring to resist removal of the legs;

the enlargement on each leg is spaced from the lower surface of the mount by more than the thickness of the leaf spring; and

the lower surface of the mount is convex to permit rocking of the mount on the leaf spring about an axis parallel to the axes of the rollers, whereby to permit one roller to move up and the other down so they both press paper firmly against the cylindrical platen.

4,611,803

STARTING BLOCK ASSEMBLY

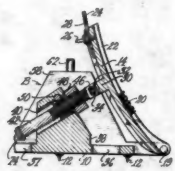
Milton A. Newton, Jr., 4392 Pampas Rd., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 510,203, Jun. 29, 1983, Pat. No. 4,561,650. This application Apr. 25, 1984, Ser. No. 603,788

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.[4] A63B *69/00*

U.S. Cl. 272—105 **4 Claims**



1. A starting block assembly comprising, in combination:

an elongated alignment bar adapted for location at the start of a running track, said bar having means for selective attachment of a starting block adjacent each side thereof, said bar being formed of two elongated pieces joinable end-to-end at a point intermediate its assembled length and having clamp means for holding the pieces together in functional position, whereby the pieces may be separated from each other and thus rendered portable for storage and traveling, and

a pair of starting blocks each having means for selective attachment to a respective side of the assembled length of said bar and at least one of said starting blocks comprising a base plate and a forward facing foot contact place disposed pivotally upstanding from a leading edge of the base plate, said base plate carrying selectively adjustable, elevating mechanism adapted to progressively tilt and hold the foot contact plate at a selected tilt between upstanding and reclined positions,

said elevating mechanism comprising support means carried by the base plate including elongated, two-piece positioning means having an upslanted forward end pivotally connected to a rear surface of the foot contact plate, one piece of said positioning means comprising a threaded shaft and the other piece comprising an operating nut threadedly carried by said shaft, one of said pieces being lengthwise displaceable relative to the other when the other is held stationary, whereby rotation of the rotatable piece may effect extension or contraction of said positioning means toward or away from the pivotally connected foot contact plate so as to determine the tilt of said foot contact plate and to support it from the rear so as to oppose back pressure of a user's foot when pressed against the forward face of the foot contact plate.

4,611,804

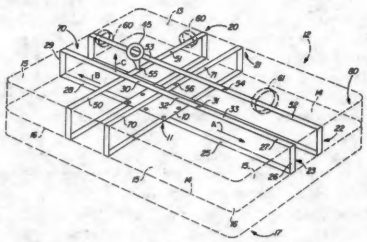
MATTRESS EXERCISE APPARATUS

George W. Addair, 334 W. Medlock, Phoenix, Ariz. 85013

Filed Mar. 21, 1983, Ser. No. 477,211

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—126 **7 Claims**



1. In combination with a bed including

a mattress including

a generally horizontal upper surface for receiving and supporting a reclining individual,

a generally horizontal bottom surface, and

a peripheral side surface spanning the distance between and generally circumscribing said top and bottom surfaces,

a support surface beneath and contacting said bottom surface of said mattress,

exercise apparatus including

(a) a pad positioned between said bottom surface of said mattress and said support surface and including an upper surface contacting said bottom surface of said mattress, the area of said upper surface of said pad being less than the area of said bottom surface of said mattress, and

(b) elongate strap means connected to said pad and including

(i) a first strap including

a first segment attached to and extending from said pad in a first direction between said bottom surface and said support surface to said peripheral side surface,

a second segment extending upwardly along said peripheral side surface, and

a third segment extending over said upper surface,

(ii) a second strap including

a first portion attached to and extending from said pad in a second direction between said bottom surface and said support surface to said peripheral side surface,

a second portion extending upwardly along said peripheral side surface, and

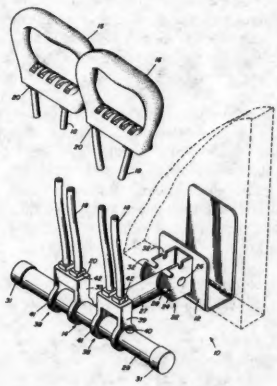
a third portion extending over said upper surface,
(iii) a third strap including
a first segment attached to and extending from said pad in a third direction between said bottom surface and said support surface to said peripheral side surface,
a second segment extending upwardly along said peripheral side surface, and
a third segment extending over said upper surface, and
(iv) a fourth strap including
a first portion attached to and extending from said pad in a fourth direction between said bottom surface and said support surface to said peripheral side surface,
a second portion extending upwardly along said peripheral side surface, and
a third portion extending over said upper surface;
said first direction generally being opposite and parallel said second direction;
said third direction generally being opposite and parallel said fourth direction,
said third and fourth straps being generally perpendicular to said first and second straps and said third and fourth directions being generally perpendicular to said first and second directions;
an individual utilizing said exercise apparatus by reclining on said upper surface of said mattress and utilizing a portion of his body to engage and
outwardly displace away from said upper surface, or
pull on
at least one of
said third segment of said first strap,
said third portion of said second strap,
said third segment of said third strap, and
said third portion of said fourth strap,
at least one of said third segments and third portions includes handle means which enable said individual to manually grasp said handle means and pull on said one of third segments and third portions.

4,611,805

EXERCISE DEVICE

Irving H. Franklin, Brockton, and Kurt M. Gluck, N. Easton, both of Mass., assignors to Franklin Sports Industries, Inc., Stoughton, Mass.

Filed Aug. 2, 1985, Ser. No. 761,911
Int. Cl.[4] A63B *21/04*
U.S. Cl. 272—136 **7 Claims**



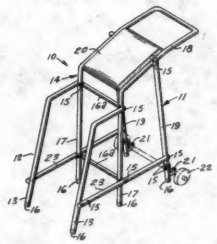
1. An exercise device comprising:
first support means for securing the device to a structure;
an exercise bar having a central shaft and a cross shaft, said cross shaft extending in a generally perpendicular position across one end of said central shaft,
said first support means having a second support means connected thereto, said central shaft being pivotably connected to said second support means and positionable at one or more discrete angles inclined relative to said first support means,
said exercise bar further including connectors on said cross shaft,
elastic cords; and
two handles having a plurality of apertures, wherein said handles are connected to said exercise bar by the elastic cords, said elastic cords being secured by clips positionable within said plurality of spaced apertures in said handles and connectors on said cross shaft.

4,611,806

EXERCISE DEVICE FOR BACK AND SPINE

Chris E. Terry, 101 S. Monitor Pl., Tucson, Ariz. 85710

Filed Jan. 25, 1984, Ser. No. 694,983
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—144 **1 Claim**



1. An exercise device for the back and spine comprising in combination, a tubular framework and a back pad affixed to said framework; said tubular framework consisting of a central frame, a front handrail stabilizer, a pair of rear legs and a plurality of cross braces rigidly securing said central frame between said handrail stabilizer and said rear legs; said central frame comprising a pair of elongated parallel bars extending upwardly from a first end to a transverse obtuse bend across both of said parallel bars forming a rearwardly, upwardly angularly inclined portion and a U-shaped portion extending between and connecting said parallel bars at a second end opposite said first end; said pair of rear legs each comprising a straight tube connected to said inclined portion and extending downwardly to support said inclined portion of said central frame; and said front handrail stabilizer comprising a pair of spaced apart downwardly extending angle shaped handrails connected to said central frame; wherein said back pad is affixed to a lower portion of said inclined portion of said central frame, said lower portion of said inclined portion being that portion which is immediately above said obtuse bends in said parallel bars.

4,611,807

EXERCISE APPARATUS HAVING A PAIR OF SPACED APART ROTATING DISCS

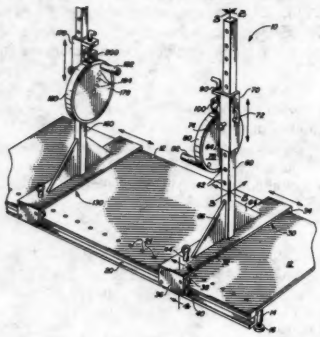
David D. Castillo, 3808 S. 12th St., Phoenix, Ariz. 85040

Filed Feb. 16, 1984, Ser. No. 580,713
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—132 **14 Claims**

1. Exercise apparatus, comprising, in combination:
base means;
post means secured to the base means;
disc means, including a first exercise disc and a second exer-

cise disc, rotatably secured to the post means for providing exercise to a user while rotating the disc means;

handle means, including a first handle secured directly to and rotatable with the first exercise disc and a second



handle secured directly to and rotatable with the second exercise disc for rotating the first and second exercise discs; and

wheel means adjustable disposed against the disc means to vary the force required to rotate the disc means.

4,611,808

STATISTICAL INFORMATION GATHERING

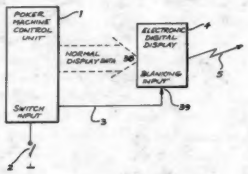
Robert L. Palmer, Birchgrove, Australia, assignor to Ainsworth Nominees Pty. Limited, Rosebery, Australia

Filed Nov. 23, 1983, Ser. No. 554,530

Claims priority, application Australia, Nov. 29, 1982, PF7026

Int. Cl.[4] A63F *7/00*

U.S. Cl. 273—138 A **19 Claims**



1. A poker machine or fruit machine system comprising:

a plurality of poker machines, each having a central control unit adapted to collect and store audit data while said machine is being played, transducer means adapted to radiate a carrier signal wherein said control unit encodes said data into a form suitable for transmission and uses said encoded data to modulate said carrier signal, and switch means adapted to initiate the transmission of said data; and

a hand carried portable receiver adapted to receive said carrier signal from one of said plurality of machines when the receiver is located in close proximity to said one machine and to decode the carrier signal so received to recover said transmitted data, storage means to store said recovered data with data previously recovered from others of the plurality of machines and means to transfer said stored data into an associated computer system, bulk storage system or printer.

4,611,809

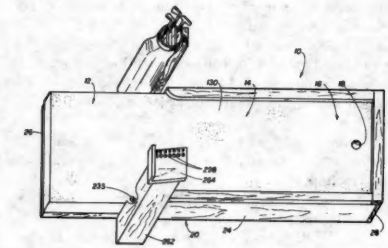
GOLF PUTTING PRACTICE APPARATUS

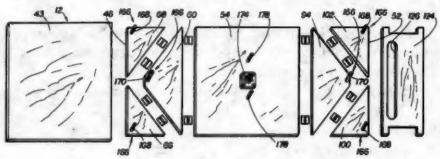
Irvin Gettelfinger, Rte. 2, Box 133, Palmyra, Ind.

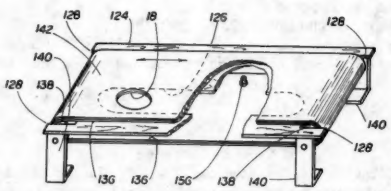
Filed Jan. 4, 1985, Ser. No. 688,991

Int. Cl.[4] A63B *67/02*

U.S. Cl. 273—176 H **25 Claims**







18. A golf ball putting practice range apparatus comprising:

a shooting area upon which a golfer stands when putting a golf ball;

a putting surface immediately downstream of the shooting area across which the golfer hits the ball;

means defining at least one golf ball target hole at the downrange end of the putting range selectively movable in a straight line transversely of the longitudinal axis of the putting surface;

means for selectively moving the golf ball target hole defining means for selectively repositioning the golf ball target hole transversely of the longitudinal axis of the putting surface; and,

golf ball return means extending from beneath the golf ball target hole defining means to the top surface of the shooting area for returning golf balls to the top surface of the shooting area.

21. A golf ball putting practice range apparatus having a selectively contourable putting surface comprising:

a plurality of planar sections disposed in adjacent edge-to edge juxtaposition;

hinge means interconnecting the juxtaposed edges of the planar actions so that the planar sections can move realtive to each other about their edge-to-edge interface; and,

contour changing means associated with one of the planar sections for selectively tilting this one section about the longitudinal axis of the putting surface, or about the transverse axis of the putting surface, or concurrently about

both the transverse axis and longitudinal axis of the putting surface, wherein the other planar sections tilt at an angle to the horizontal in response to the movement of the one section associated with the contour changing means about either the longitudinal axis of the putting surface, or the transverse axis of the putting surface, or concurrently about both the transverse axis and longitudinal axis of the putting surface.

4,611,810

GOLF BALL

Toshihiko Kamata, Kagawa; Shunji Izumi, Okayama; Kazuo Irimajiri, and Setsuji Edagawa, both of Kochi, all of Japan, assignors to Toyo Denka Kogyo Co., Ltd., Kochi and Kamatari Co., Ltd., Kagawa, both of, Japan

Filed May 28, 1985, Ser. No. 738,543

Claims priority, application Japan, Dec. 2, 1982, 57-210629

Int. Cl.[4] A63B *37/00*

U.S. Cl. 273—218 **1 Claim**

1. A golf ball in the shape of a sphere comprising a rubber composition filled with 15 to 50 parts by weight of calcium carbonate based on 100 parts by weight of the rubber, wherein the calcium carbonate is of ultrafine paticles having a BET specific surface area of 60 to 300 m^2/g and a particle diameter of 0.035 to 0.010 micrometers, whereby said golf ball has a compression strength greater than 7000 kg-f according to ASTM D-575 and a rebound height greater than 90 cm when dropped from a height of 120 cm on a steel plate, according to JIS S7005-1955.

4,611,811

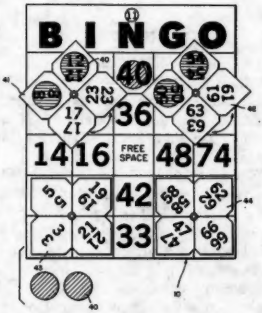
BINGO GAME WITH MEANS TO CHANGE PART OF THE BINGO PATTERN

Robert Haase, 1639 Mardell Street, London, Ontario, Canada (N5V 1X3)

Filed Mar. 22, 1984, Ser. No. 594,882

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—237 **11 Claims**



1. An electronic game apparatus for use by a player, said apparatus comprising:

electronic means for permanently storing a plurality of different playing patterns with each pattern comprising a plurality of sections arranged in an array;

means for electronically selecting a particular pattern by player command;

alterable electronic means for displaying a planar playing surface comprising said selected pattern;

means for creating a unique symbol for the life of a game in a predetermined number of sections of said electronically displayed array, said predetermined number of unique symbols filling only a portion of said electronically displayed sections and thereby defining a plurality of remaining sections;

means for displaying a first color in each of said predetermined sections;

said remaining sections of said electronically displayed array comprising discrete groups of adjacent sections which temporarily display for a time less than the life of the game a second color different than said first color with each discrete group of adjacent sections defining a playing area of lesser dimension than said electronically displayed selected pattern;

additional means for displaying said first color in selected ones of said remaining sections in each of said discrete groups, said additional means having means to relocate said first color in selected ones of said remaining sections to different sections within the same discrete group in response to player commands; and

means for alterably displaying and relocating a further unique symbol in each of said remaining sections of a discrete group, said means for alterably displaying comprising means for relocating said further unique symbols from their original location in a respective section of one of said discrete groups to any other section of said same discrete group in response to additional player commands, and relocating said further unique symbols of one discrete group relative to said unique symbols and relative to said further unique symbols of said other discrete groups.

4,611,812

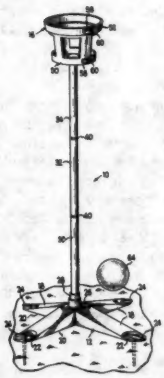
BALL GAME GOAL

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed May 16, 1985, Ser. No. 734,543

Int. Cl.[4] A63B *63/08*

U.S. Cl. 273—400 **17 Claims**



1. A portable, elevated, ball receiving game comprising:

a base;

a generally vertically oriented, elongated height stem, one end of which is securable to the base;

the stem having an outer diameter of approximately one inch;

an open top ball receiving basket with a closed bottom attached to the other end of the stem;

a ball sized to be received within the basket; and

the flexibilty of the stem providing means for ejecting the ball from the basket through the open top.

15. A method of ejecting a ball from an elevated, closed bottom, ball receiving goal that is supported upon an elongated stem with a generally vertically oriented axis comprising the steps of:

the player grasping the stem at a point intermediate the basket and the base; and

the player exerting a force in a plane generally transverse to the axis of the stem resulting in the basket being repeatedly displaced from its initial orientation so as to cause ejection of the ball from the basket.

4,611,813

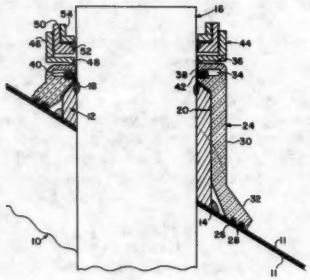
METHOD OF AND APPARATUS FOR PROVIDING AN ANNULAR SEAL

Hector N. Guerrero, Simsbury, Conn., assignor to Combustion Engineering Co., Inc., Windsor, Conn.

Filed Sep. 28, 1984, Ser. No. 655,871

Int. Cl.[4] F16J *15/06*

U.S. Cl. 277—1 **18 Claims**



1. Apparatus for establishing a fluid-tight seal about a first tubular member which extends outwardly from a surface, the tubular member having an axis, said apparatus comprising:

tubular sleeve means, said sleeve means having an axis and a first outwardly diverging end portion, said sleeve means having a second end portion oppositely disposed with respect to said first end portion;

first annular seal means, said first seal means being mounted on said sleeve means first end portion, said first seal means being positioned so that a surface thereof will face in a first direction and will be in contact with the surface from which the first tubular member extends when said sleeve means is located coaxially with the first tubular member;

second annular seal means, said second seal means being mounted on said sleeve means second end portion, said second seal means being positioned so that a surface thereof will face in second direction which is different than said first direction, said second direction being generally toward the axis of said sleeve means;

means for delivering a compressive force to said second seal means; and

pre-loading means, said pre-loading means being mechanically coupled to said delivering means and generating a force which is coupled to said sleeve means via said delivering means, said first and second seal means being biased by the force generated by said pre-loading means and being further compressed in response to the immersion of said sleeve means in a pressurized fluid.

4,611,814

METHOD AND APPARATUS FOR MONITORING THE OPERATING READINESS OF POWER CHUCK

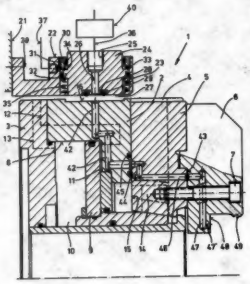
Karl Hiestand, Mühlweg, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,442

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402989

Int. Cl.[4] B23B *31/30*

U.S. Cl. 279—111 **11 Claims**



1. An arrangement for monitoring the operating conditions at standstill of a power chuck with respect to the workpiece to be clamped by the power chuck, comprising:

a chuck body having a radially extending groove;

a master jaw guided for radial movement in said radially extending groove;

a clamping jaw fixed to said master jaw;

said chuck body and said master jaw having interengageable radial contact surfaces;

said master and clamping jaws having interengageable contact surfaces;

said clamping jaw and the workpiece having interengageable contact surfaces;

a fluid passage having portions extending through said chuck body, said master jaw and said clamping jaw with an inlet end in said chuck body and an outlet end in said clamping jaw at said contact surface of said clamping jaw interengaged with the contact surface of the workpiece; said portions of said fluid passage communicating with each other over said interengageable contact surfaces when said chuck body, master jaw, clamping jaw and workpiece are in a correct relative position for clamping the workpiece; and a pressure fluid source connectable to said inlet of said fluid passage for supplying fluid to said fluid passage.

4,611,815

VEHICLE HEIGHT CONTROL SYSTEM

Yoshihiro Sasage, Shizuoka; Naoto Ooka, Toyohashi, and Knoru Oohashi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 26, 1984, Ser. No. 665,064

Claims priority, application Japan, Oct. 27, 1983, 58-202434

Int. Cl.[4] B60G *17/04*

U.S. Cl. 280—6 R **5 Claims**

1. A vehicle height control system comprising:

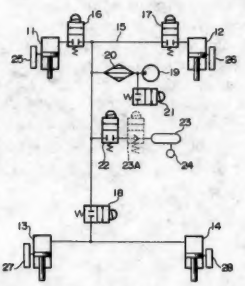
a plurality of vehicle height adjusters operated in response to respective control signals;

position signal generator means for generating actual position signals each representing a vehicle height of a wheel corresponding to one of said vehicle height adjusters;

setting means for changing target adjustment positions of respective vehicle height adjusters; and

control means for generating the control signal for each of said vehicle height adjusters in accordance with a target difference between the target adjustment position and the actual position signal to adjust the vehicle height to achieve the target adjustment position,

said control means comparing said target difference for each vehicle height adjuster with a first set value range (α_1) and generating an up-command to increase the vehicle height when said target difference exceeds an upper limit of said first set value range (α_1) and generating a down-command to decrease the vehicle height when said target difference is below said value range (α_1),



said control means comparing said target difference with a second set value range (α_2) smaller than said first set value range (α_1) and generating a cancel signal when said target difference enters into said second set value range (α_2), and

said control means selecting one of said target differences, for the respective adjusters, having the largest magnitude of absolute value of said target differences, and selecting one of said vehicle height adjusters corresponding to the selected target difference to thereby enable the selected vehicle height adjuster to perform its adjusting operation first, thereby taking priority over the other vehicle height adjusters.

4,611,816

CARGO HANDLING SYSTEM

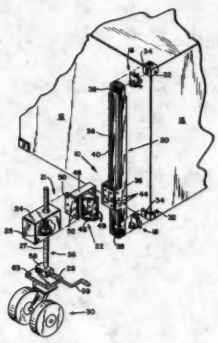
Martin S. Traister, Lexington; James R. Fay, Marlboro; Charles E. Becher, Brookline; John M. Calligeros, Winchester, all of Mass.; Foster R. Harris, Dayton, Ohio; Kevin M. Powderly, Weilerbach, Fed. Rep. of Germany, and Joseph M. Nicholson, Medford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 10, 1984, Ser. No. 659,484
Int. Cl.[4] B60P *3/40*
U.S. Cl. 280—43.2 **4 Claims**

1. A jack assembly for use in the loading and unloading of cargo, comprising:

a jacking mechanism, said jacking mechanism including a jack and caster/wheel unit removably secured thereto;

means operably connected to said jacking mechanism for removably securing said jacking mechanism to said cargo in two different orientations, said removable securing means including a support column, means interposed between said jacking mechanism and said support column for affixing said jacking mechanism to said support column in two distinct and separate positions with respect to said suport column, said affixing means including a member having a first and a second end, said first end thereof being affixed to said jacking mechanism, said member having an extension protruding therefrom and being positioned substantially midway between said first and said second ends, said extension having a flat surface thereon for attachment to said support column at said two distinct and separate positions in order to provide said two different orientations of said jacking mechanism with respect to said cargo,



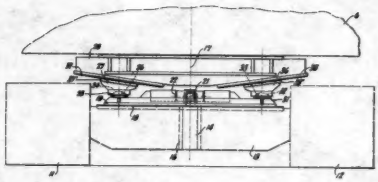
and means for removably attaching said support column to said cargo in at least one position.

4,611,817

HEAVY TRANSPORT BOLSTER CONSTRUCTION

Kenneth F. Dewing, Benicia, Calif.; Donald C. Harlander, Driggs, Id., and Ralph O. Hughes, Walnut Creek, Calif., assignors to McKay International Engineers, Benicia, Calif.

Filed Feb. 28, 1983, Ser. No. 427,044
Int. Cl.[4] B60P *1/00*
U.S. Cl. 280—145 **5 Claims**



1. A heavy transport bolster construction comprising a pair of tranversely spaced ground-engaging members, and axle engaging said members and spanning the space between them, a supporting beam disposed generally transversely above said axle, a pair of oppositely inclined planar bearing pads on the bottom of said beam near the ends thereof, a pair of planar bearing plates each abutting a respective one of said bearing pads, a pair of bearing blocks respectively carrying said bearing plates, a table beam below said body supporting beam, and means defining a ball and socket connection between said bearing blocks and said table beam.

4,611,818

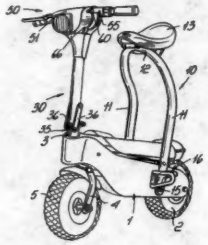
COLLAPSIBLE VEHICLE, PARTICULARLY OF THE TWO-WHEELED TYPE

Italo Cammarata, Pino Torinese, Italy, assignor to Quasar s.r.l., Torino, Italy

Filed Apr. 4, 1985, Ser. No. 720,199
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—278 **6 Claims**

1. A collapsible vehicle particularly of the two wheeled type comprising a main frame, a steering column having an upper section, handle bar sections, at lest one front wheel, at least one rear wheel, rods, a saddle holder, a saddle, and a front cross-piece, said main frame being adapted for supporting said at

least one rear wheel and said front crosspiece, said steering column being pivotally connected to said main frame and adapted for supporting said at least one front wheel, said upper section of said steering column being tiltable towards said main frame, said handle bar sections being associated with and tiltable towards said upper section, said saddle holder having a rod-like body, said rod-like body having a substantially U-like configuration defining legs, said legs being arranged laterally with respect to said main frame, each of said legs having a free



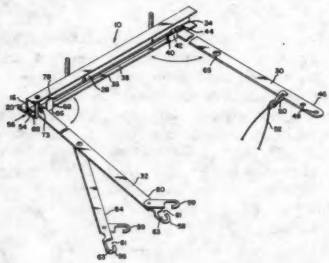
end, a middle portion, and at least one pin at said free end of each of said legs, said main frame having defined thereon contoured slots, each said at least one pin being engageable in at least one of said contoured slots, said saddle holder being tiltable towards said main frame to bring said saddle forward of the main frame, said rods each having at least one end and at least one other end, said at least one end of each of said rods being hingedly connected to said middle portion of one of said legs, said at least one other end of each of said rods being hingedly connected to said front crosspiece.

4,611,819

LUGGAGE ATTACHMENT FOR WHEELCHAIR

Charles H. Glasford, 1005 S. 322nd Pl., Federal Way, Wash. 98003

Filed Jul. 17, 1985, Ser. No. 756,099
Int. Cl.[4] B62J *7/02*
U.S. Cl. 280—289 WC **7 Claims**



1. A stowable, wheelchair luggage towing attachment for towing wheeled luggage along one side of a wheelchair without interfering with the operation of the wheelchair, comprising:

an elongated body having forward and rearward ends and means for connecting the body to the underside of an arm of a wheelchair;

a tow arm having a free end portion and an attached end portion, the free end portion having means for connecting a luggage tow strap thereto, the attached end portion having means for connecting the tow arm to the body so that the tow arm can assume an extended position in a laterally outward direction;

means on the body for holding the tow arm in the extended position and against substantial rearward movement relative to the body so that forward motion of the wheelchair is transferred through the body to the luggage tow strap;

a guide arm having a free end portion and an attached end portion, the free end portion having means for connecting a luggage handle thereto and for orienting the luggage in a substantially parallel direction with the straight line travel of the wheelchair, the attached end portion having means for connecting the guide arm to the body so that the guide arm can assume an extended position in the laterally outward direction, the body having longitudinally extending upper and lower walls defining an interior longitudinally extending stowage channel opening in the laterally outward direction, sized to accept the tow arm and guide arm therein in retracted positions;

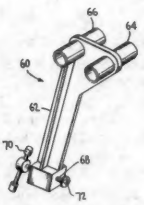
means on the body for holding the guide arm in the extended position and against substantial forward and rearward movement.

4,611,820

WHEEL SUPPORT ASSEMBLY FOR A BOAT

Harold E. Massey, Sr., 5810 Hubbard La., Bartonville, Ill. 61607, and Ronald L. Hamm, 910 Lehmann Bldg., Peoria, Ill. 61602

Filed Oct. 16, 1984, Ser. No. 661,567
Int. Cl.[4] B63C *13/00*
U.S. Cl. 280—414.2 **20 Claims**



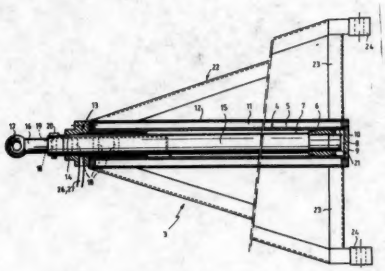
1. A wheel support assembly adapted for use in transporting a boat, the assembly comprising a wheel support including a frame, and suspension means attached to the frame which includes an axle, said frame including at least two extending arms, each arm having at least two apertures therein, the apertures of one arm being axially aligned with the apertures of the other arm, the frame further including two additional arms having at least one aperture therein axially aligned with an aperture in each of the extending arms; a locking member comprising an elongated bar having, at one end, two guides having axially parallel bores, the axes of the bores being spaced from each other the same distance as the axes of the two apertures in each arm are spaced from each other, the elongated bar having clamping means at the other end; a pivot rod adapted to pass through one bore of said guides and through an aperture in each arm; and a lock rod adapted to pass through the bore of the other of said guides and through an aperture in each arm.

4,611,821

EXTENSIBLE HITCHING DEVICE FOR ROAD AND RAIL VEHICLES

René H. Jeanson, Rue de la Cour, Auzay 85200 Fontenay Le Comte, and Guy Lamothe, Rue Gallot, Fontenay Le Comte, both of France

Filed Sep. 23, 1985, Ser. No. 778,714
Claims priority, application France, Sep. 24, 1984, 84 14608
Int. Cl.[4] B62D *53/00*
U.S. Cl. 280—482 **17 Claims**



1. A vehicle comprising a chassis (57) and an extensible hitching device (3) whose front end is provided with a coupling device (17;88) adapted to be connected to the rear of another vehicle, characterized in that the hitching device (3) comprises a hydraulic actuator (4;75) comprising a cylinder (5;77), a piston (6,80) a piston rod and a chamber (7,81,89) containing a hydraulic fluid; a hydraulic circuit comprising a reservoir (25) connected to the chamber (7;81,89) of the actuator (4;75) through two ducts (26,27) comprising one a normally closed valve (28) and the other a hydraulic pump (30); resilient means urging the coupling device (17;88) in the direction of the other vehicle; detection means for controlling the opening of the valve (28) when the two vehicles, in the hitched position, form therebetween an angle greater than a given angle and allow the resilient means to extend the coupling device (17;88) in the direction of the other vehicle while driving back into the reservoir (25) the hydraulic fluid contained in the chamber (7;81,89); and control means for actuating the hydraulic pump (30) so that the hydraulic fluid driven back into the chamber (7;81,89) causes the coupling device (17;88) to retract against the action of the resilient means.

4,611,822

CROSS COUNTRY SKI BINDING

Gary E. Bernhardson, Box 2301, Soldotna, Ak. 99669

Continuation-in-part of Ser. No. 484,913, Apr. 14, 1983, Pat. No. 4,557,498. This application Nov. 18, 1985, Ser. No. 798,944
Int. Cl.[4] A63C *9/10*
U.S. Cl. 280—615 **10 Claims**

1. A cross-country ski binding for connecting a ski boot having a slotted toe plate thereon to a ski, which comprises:

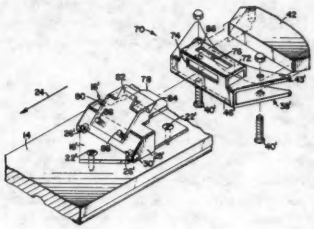
a base plate adapted for mounting on a ski;

said slotted toe plate having a raised portion including longitudinally spaced-apart front and rear upright walls and an interconnecting top wall, the front and rear walls having aligned transverse openings therein defining a slot extending longitudinally through the raised portion, and the top wall having a transverse opening therein defining a slot extending vertically into the raised portion;

a pivot plate having a transverse rear portion adapted for snug receipt in the longitudinal slot in the raised portion of said toe plate;

means for hingedly interconnecting said base and pivot plates for relative pivotal movement about a transverse axis; and

means including a resilient latch associated with said base and pivot plates and normally urged into position for engagement with the vertical slot in the raised portion of



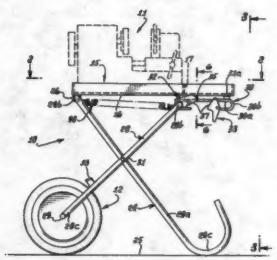
said toe plate for releaseably securing the boot to the binding.

4,611,823

COLLAPSIBLE CARRIER STAND FOR HEAVY MACHINE

John L. Haas, Roland Heights, Calif., assignor to Roco Tool Group, Inc., Monterey Park, Calif.

Filed Feb. 11, 1985, Ser. No. 700,490
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—641 **11 Claims**



1. A collapsible carrier for a heavy machine, comprising

(a) an upper platform adapted to support the machine,

(b) first leg means pivotally attached to the platform and extending downwardly and forwardly relative to the platform,

(c) second leg means having upper extent located to support the platform and extending downwardly and rearwardly relative to the platform,

(d) the first and second leg means pivotally interconnected below the level of said platform,

(e) there being a slide surface associated with the platform and presented to transmit loading to said second leg means upper extent as said upper extent travels therealong between first and second positions corresponding to raised and lowered positions of the platform, and there being stops associated with the platform to limit said travel at said first and second positions,

(f) releasable lock means to lock said second leg means upper extent to the platform at said second leg means first and second positions,

(g) and counterbalance means operatively connected with said first and second leg means to yieldably resist downward movement of the platform, thereby counterbalancing the weight of said machine, said counterbalance means including a tension spring having an end operatively con-

nected to said second leg means upper extent, at a location below the level of said platform,

(h) said slide surface being defined by a guide plate the opposite ends of which extend downwardly and reversely with U-shape to form said stops, the guide plate downwardly open between said U-shaped ends and below said slide surface,

(i) said releasable lock means including a lock element operatively engaged by the second leg means upper extent and moveable upwardly adjacent one of said U-shaped guide plate ends in said first position of the second leg means upper extent,

(j) the first leg means having upper end extent pivotally attached to the platform, and also to which the counterbalance means is attached, below the level of the platform,

(k) said releasable lock means comprising latch elements carried by the guide plate to move into latching position relative to said second leg means upper extent in each of said first and second positions, and being manually releasable from said latching positions to allow travel.

4,611,824

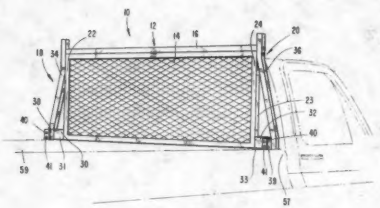
CAB GUARD

Thomas K. McIntosh, Bloomfield, Ind., assignor to The Bloomfield Manufacturing Company, Inc., Bloomfield, Ind.

Filed Aug. 12, 1985, Ser. No. 764,492

Int. Cl.[4] B60R *21/02*

U.S. Cl. 280—748 **9 Claims**



1. A cab guard alternatively adaptable for a wide bed pickup truck with a pair of front stake pockets and a mini pickup truck with a pair of bed rails, comprising;

a rigid screen structure including a planar screen mesh having two ends,

a pair of rigid end brackets each constructed and adapted for attachment to one of the ends of said screen structure in alternate first and second operating positions, and

mounting means for mounting said screen structure in alternative first and second operating positions;

in the first of the operating positions said end brackets being attached to the ends of said screen structure and extending outwardly of said screen structure in a plane coplanar with the screen mesh, and said mounting means being for mounting each of said end brackets in one of the front stake pockets of a wide bed pickup truck, and

in the second of the operating positions said end brackets being attached to the ends of said screen structure and extending in a plane perpendicular to the screen mesh, and said mounting means being for mounting each of said end brackets to one of the bed rails of a mini pickup truck.

4,611,825

ADJUSTABLE ANCHORAGE

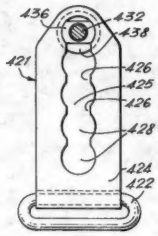
Michael Patterson, Carlisle, England, assignor to ASE (UK) Limited, Carlisle, England

Division of Ser. No. 482,293, Apr. 5, 1983, Pat. No. 4,550,933. This application Jul. 25, 1985, Ser. No. 758,979

Claims priority, application United Kingdom, Apr. 8, 1982, 8210494; May 24, 1982, 8215103

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **19 Claims**



1. Adjustable anchorage means comprising a first member having a slot and a second member received in said slot, said slot having at least one narrow portion joining wider portions and said second member being rotatable relative to the first member about an axis transverse to the direction of extent of said slot and being so shaped that in a first angular position thereof relative to said first member, said first and second members are relatively movable in said direction of extent of the slot and in a second angular position thereof relative to said first member, said second member is restrained against such movement by engagement of said second member in a wider portion of said slot.

4,611,826

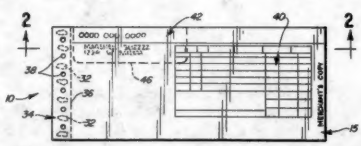
ANTI-FRAUD CREDIT CARD TRANSACTION FORMSET

Thomas J. Breen, Arlington Heights, Ill., assignor to Rand McNally & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 425,064, Sep. 30, 1982, Pat. No. 4,512,595. This application Feb. 11, 1985, Ser. No. 700,139

Int. Cl.[4] B41L *1/20, 1/24*

U.S. Cl. 282—8 R **16 Claims**



1. A credit card transaction formset, including a zone therein in which the customer's identification is adapted to be impressed via an embossed credit card and an image impressing machine, the formset including at least two transaction slips and an interleaved duplicating slip, each said slip being secured at one end to form a stub and defining an opposite free end remote from said stub, and each of said transaction slips defining a line of severance adjacent said one end for removal thereof from said stub,

said duplicating slip defining a segment intermediate said ends and at the zone in which the customer's identification is adapted to be impressed, said segment being dimensioned to receive the entirety of said customer's identification, said segment being removable from said duplicating slip along a line of perforation provided in said duplicating slip, and

means securing said segment to the overlying one of said

transaction slips so that when said overlying transaction slip is removed from said stub along its line of severance, said segment is automatically removed therewith.

11. A credit card transaction formset, including a zone therein in which the customer's identification is adapted to be impressed, the formset including at least three transaction slips comprising a merchant slip, a customer slip, and credit card issuer slip, and an interleaved carbon paper slip intermediate the customer slip and another of said transaction slips, each said slip being secured at one end to form a stub and defining an opposite free end remote from said stub, and each of said transaction slips defining a line of severance adjacent said one end for removal thereof from said stub,

the uppermost of said slips being generally transparent and being adapted to receive an image on the bottom surface thereof, the customer slip having an image transferring coating on its upper surface and confronting said bottom surface,

said carbon paper slip defining a segment intermediate said ends and at the zone in which the customer's identification is adapted to be impressed, said segment being dimensioned to receive the entirety of said customer's identification, said segment being removable from said carbon paper slip along a line of perforation provided in said carbon paper slip,

and means adhering said segment to the overlying customer transaction slip so that when said overlying customer transaction slip is removed from said stub along its line of severance, said segment is automatically removed therewith.

4,611,827

COMPENSATOR FOR THE COMPENSATION OF AXIAL MOVEMENTS OF PIPE CONDUITS

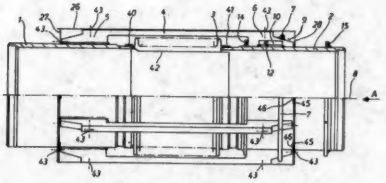
Wilhelm Marti, Horw, and Leo Burri, Malters, both of Switzerland, assignors to Boa A. G. Luzern, Luzern, Switzerland

Filed Jun. 26, 1984, Ser. No. 624,817

Claims priority, application Switzerland, Jul. 27, 1983, 4119/83

Int. Cl.⁴ F16L *51/02*

U.S. Cl. 285—3 **10 Claims**



1. A compensator for the compensation of axial movements of pipe conduits and including a first sleeve, a second sleeve and a bellows, the first sleeve to be mounted to a section of a pipe conduit, the second sleeve to be mounted to an another section of said pipe conduit and the bellows interconnecting said first and said second sleeves, and including a guiding means for a mutual axial guiding of said first and said second sleeves which guiding means rests slidingly displaceable on at least one of said sleeves; said guiding means comprising a plurality of brackets bridging said bellows axially and having a first end section and a second end section where the second end section is axially located opposite of said first end section, at least one of said end sections of each bracket resting slidingly displaceable on a respective sleeve, said end sections of said brackets located at a mutual distance around the circumference of the respective sleeve, and comprising at least one clamping ring extending around the bracket end sections resting slidingly displaceable on a respective sleeve, said clamping ring biassing said respective bracket end sections against the respective sleeve into a sliding engagement and being fixedly mounted to at least several of said brackets.

4,611,828

END MEMBERS FOR BICYCLE PUMP CONNECTORS

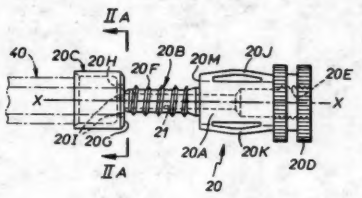
Patrice Brunet, Neuilly-sur-Seine, France, assignor to Poutrait-Morin, Aubervilliers, France

Filed Sep. 28, 1984, Ser. No. 655,464

Claims priority, application France, Sep. 30, 1983, 83 15598

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—3 **8 Claims**



1. Apparatus adapted to be assembled with a flexible tube to form a connector for a portable pump for inflating tires, said apparatus comprising a set of end members including a first end member having means for forming a connection with a pump and a second end member having means for forming a connection with a valve of a tire, each of said end members having an anchoring stub, said anchoring stub having an external surface adapted to receive a respective end of the flexible tube, said anchoring stub being formed at one side of a middle zone of a respective one of said end members and being extended by an end cap, each end cap being joined to a respective anchoring stub by at least two frangible bridges, each of said end members being of one-piece molded plastics construction, said frangible bridges being adapted to be broken to separate each cap from the respective anchoring stub when a tube end is inserted into such end cap whereby a respective tube end will be gripped between such end cap and the respective anchoring stub.

4,611,829

MISALIGNMENT TIEBACK TOOL - SWIVEL CONNECTION

David W. Hughes, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Oct. 12, 1984, Ser. No. 659,604

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—18 **12 Claims**

1. A tieback tool for connecting a tieback conductor to a subsea well system comprising:

a hollow tubular body member connected to the tieback conductor,

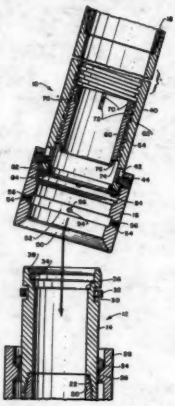
aligning means on said tubular body member for aligning and locking said tool onto said well system, said aligning means including,

a stab connector telescoped on one end of said tubular body member,

means for mounting said stab connector in pivotal relationship with said tubular body member so that said stab connector is free to align with said subsea well system on initial engagement therewith,

said pivot being activated upon initial engagement of said subsea well system,

means for locking said stab connector and said tool in initial alignment with said well system, and



stab means for engaging said well system in final alignment of said tubular body member with said well system.

4,611,830

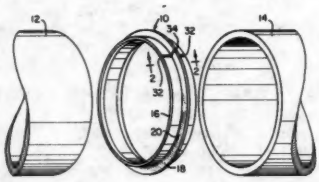
PARTIALLY CONSUMABLE SPACER CHILL RINGS AND THEIR USE IN WELDING PIPE JOINTS

Roger W. von Ahrens, Avenel, N.J.

Continuation-in-part of Ser. No. 241,715, Mar. 9, 1981, abandoned. This application Mar. 9, 1984, Ser. No. 587,492

Int. Cl.⁴ F16L *13/02*

U.S. Cl. 285—22 **17 Claims**



1. A partially consumable spacer chill ring for welding a pair of adjacent pipe ends, comprising:

a non-consumable, substantially annular, base metal ring having an outside diameter permitting a snug fit interiorly of the pipe ends to be welded, said non-consumable base metal ring being effectively continuous with at most a small transverse slit; and

a consumable, substantially annular, filler metal spacer ring medially attached to the exterior of said base ring and projecting radially outwardly therefrom, for spacing apart said pipe ends and for welding said pipe ends together by supplying filler metal from said consumable spacer ring only to the weld during a first root pass of a welding operation, said consumable filler metal spacer ring being effectively continuous with at most a small transverse slit.

4,611,831

CONNECTION DEVICE FOR SIMULTANEOUSLY CONNECTING A SERIES OF CIRCUITS

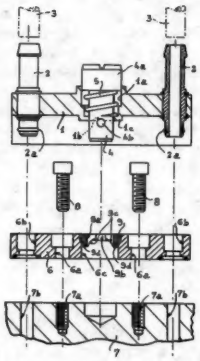
Gaston Truchet, Faverges, France, assignor to S.A. Des Etablissements Staubli, Faverges, France

Filed Jun. 5, 1985, Ser. No. 741,430

Claims priority, application France, Jun. 14, 1984, 84 09530

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—26 **2 Claims**



1. In a connection device for simultaneously connecting multiple fluid circuits, the connection device having first and second interfitting support pieces carrying mating male and female elements operative to connect said fluid circuits, and the support pieces being maintained in mating position by lock means passing through bore in the pieces, the lock means comprising:

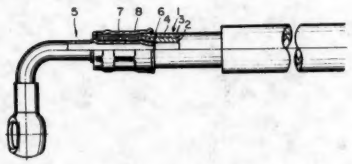
a cylindrical twist lock extending through the bore in the first support piece, the twist lock having a head at one end and having pin means extending transversely across the twist lock near the other end and maintaining the twist lock in the bore with its other end extending toward the second support piece, the first support piece having recesses positioned to receive said pin means, and spring means around the twist lock between its head and the first support piece and yieldably urging the pin means into engagement with the recesses when the twist lock is in a predetermined angular orientation; and

a bushing fixed in the bore through the second support piece, the bushing having an opening to pass the twist lock therethrough and the opening having notches located laterally thereof and extending parallel to the opening to pass the pin means through the bushing when the twist lock enters the opening with said predetermined angular orientation, and the bushing having ramps extending from the notches away from the first support piece when mated and terminating in recesses positioned to receive and retain the pin means when the twist lock is inserted through the opening and rotated so that the pin means ride up the ramps into their recesses to compress the spring means.

4,611,832
HOSE JOINT

Mitsuyuki Matsuoka, and Masanobu Ohnishi, both of Komaki, Japan, assignors to Tokai Rubber Industries Ltd., Komaki, Japan

Filed Mar. 19, 1984, Ser. No. 590,858
Claims priority, application Japan, Mar. 26, 1983, 58-51306
Int. Cl.[4] F16L *33/01*
U.S. Cl. 285—55 6 Claims



1. A reusable non-adhesive hose joint structure for an automotive fuel line comprising:

a hose comprising an inner tube, a reinforcing layer surrounding said inner tube, and an outer tube surrounding said reinforcing layer, said inner tube of said hose comprising at least an inner layer comprised of fluorine rubber;

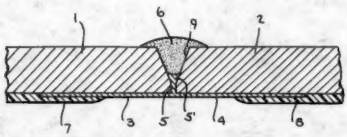
a hose joint provided on one end of a connecting pipe and having a metallic nipple portion coated with a thermosetting resin which comprises phenolic resin, said thermosetting resin being free if crystallization at temperatures at least as low as −40° C., said nipple portion being disposed within said end of said hose such that said thermosetting resin of said nipple and said fluorine rubber of said hose are disposed in face-to-face contact; and

a member provided around said hose adjacent to said one end thereof for urging said hose in a generally radially inward direction toward said nipple portion, whereby the face-to-face contact between the thermosetting resin and the fluorine rubber provides a maintenance free non-adhesive reusable seal that is effective between −40° C. and 100° C.

4,611,833
PIPE JOINTS AND PROCESS FOR THEIR PRODUCTION

Pierre L. Lescaut, Bernay, France, assignor to Atochem, France

Filed May 10, 1985, Ser. No. 732,847
Claims priority, application France, May 24, 1984, 84 08152
Int. Cl.[4] F16L *13/02*
U.S. Cl. 285—55 12 Claims

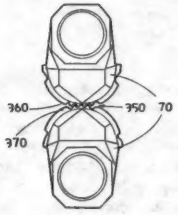


1. A pipeline internally coated with heat sensitive material to protect the interior of the pipe from corrosion or abrasion and comprising at least two pipe sections connected by a welded joint, wherein the interior of each metal pipe is coated with a stainless metal alloy for a distance of from one-half to three pipe diameters from the end of the pipe and there is a reserved zone at the end of the pipe which reserved zone is free of the heat sensitive material which otherwise covers the interior wall of the pipe, the heat sensitive coating overlapping the stainless metal alloy coating for at least about 20 millimeters from the end of the pipe, the edge of each section being coated with the stainless alloy and constituting the welded joint between the two pipe sections, the pipe sections being joined together by the bond formed by stainless alloy with the edges of the pipe and further bonded by an outer weld of metal which is of substantially the same metal as the metal comprising the pipe.

4,611,834
UNRESTRICTED SWIVEL JOINT

Joshua Rabinovich, 358 Chestnut Hill Ave., Boston, Mass. 02146

Filed Dec. 31, 1984, Ser. No. 687,919
Int. Cl.[4] F16L *27/00*
U.S. Cl. 285—131 5 Claims



1. Fluid delivery apparatus having first and second unrestricted, leakproof, rotatable fluid flow joints, each joint comprising:

a flexible rod means;

a first elbow;

a second elbow; and

a resilient O-ring;

the first elbows including means for rotatably receiving the second elbows, means for rotatably connecting the elbows with the flexible rod means, and means for guiding the flexible rod into the means for rotatably connecting,

the second elbows including means for rotatably mating with the means for receiving and means for rotatably connecting the elbows;

wherein the flexible rod means slidably inserts within at least a portion of the means for rotatably connecting to connect the first and second elbows; and

wherein at least one of the elbows includes means for holding the O-ring between the flexible rod and the end of the second elbow, said O-ring disposed in resilient contact with and between the means for receiving and the means for mating; and

a fluid dispensing means, wherein the first elbows of each joint are rotatably mounted within the fluid dispensing means in back to back relationship such that the back outside surfaces of the first elbows of the joints are disposed in close face to face relationship, each of the back outside surfaces of the first elbows facing each other including means for limiting the degree of coaxial rotation of the first elbows relative to each other.

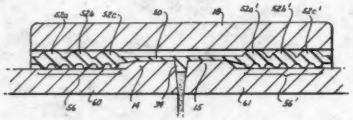
4,611,835
PIPE COUPLING

Morris Gittleman, Los Angeles, Calif., assignor to Familian Corp., Van Nuys, Calif.

Filed Feb. 17, 1984, Ser. No. 581,033
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—155 9 Claims

1. A pipe coupling for coupling the ends of pipes or conduits in fluid-tight relationship and adapted for pipes either with or without external annular end ribs comprising, in combination, clamping means configurated for clamping around the pipe ends, the said clamping means being rigid and generally circular, circular axially and circumferentially continuous gasket means interposed between the clamping means and pipe ends

being coupled and spanning the ends of the pipes, said gasket means having an axial length substantially equal to the axial length of said clamping means, the improvements comprising the said clamping means over its entire axial length having smooth, uninterrupted inner surfaces, being of uniform internal diameter said gasket means having a smooth, uninterrupted intermediate outer surface portion, said gasket means having at least one external rib between the said intermediate portion and



each end of the gasket and having internal ribs opposite each external rib, said external ribs having sufficient radial dimension so as to normally provide a space between the intermediate portion of the gasket and the inside surfaces of the clamping means whereby to accommodate pipe ends having different diameters and/or pipe ends having spigots by allowing movement of the intermediate portion of the gasket means into said space during compression of the gasket.

4,611,836

TUBULAR CONNECTING DEVICE

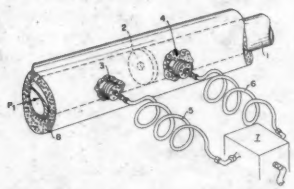
Christiaan De Boks, Prinsenbeek, Netherlands, assignor to M & C Products B.V., Breda, Netherlands

Filed Aug. 20, 1984, Ser. No. 642,105

Claims priority, application Netherlands, Aug. 23, 1983, 8302948

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—158 **8 Claims**



1. A device for connecting a measuring instrument with a process duct for process control, comprising at least one pressure duct between the measuring instrument and the process duct, and coupling means connecting the pressure duct with the process duct and the measuring instrument respectively; said coupling means comprising first and second coupling sleeves adapted to be fastened to the process duct and the measuring instrument respectively and each having a diameter greater than the diameter of said pressure duct, a first adapter piece fitted and fixed within an end of the first sleeve and a second adapter piece fitted and fixed within an end of the second sleeve, said adapter pieces having a diameter equal to the diameter of said pressure duct, and first and second releasable clamping sockets disposed between the first and second adapter pieces and respective opposite ends of the pressure duct.

4,611,837

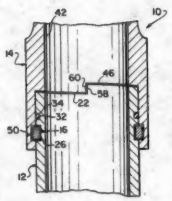
TUBULAR ELEMENT COUPLING MEANS

Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Grumann Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,575

Int. Cl.[4] F16L *37/14*

U.S. Cl. 285—305 **9 Claims**



1. A coupling for tubular elements, said coupling taking axial and torsional loads, comprising: a first coupling element the end portion of which is received in the end portion of a second coupling element, a helix in said end portion in each of said elements, a first annular peripheral groove in the outside diameter of said first element end portion, a second annular peripheral groove in the inside diameter of said second element end portion, a slot through the wall of said second element providing access to said second groove, and a split locking ring, wherein, when said first element end portion is received into said second element end portion with the first element helix in contact with said second element helix, said first annular groove is overlain by said second groove, whereby said locking ring is fed through said slot into said grooves to couple said elements together such that said ring reacts axial tension forces and said helices transmit torsional forces and axial compression forces, the relative rotation of said helices with respect to one another serving to load said locking ring axially to tighten said coupling, and wherein said locking ring has means permitting it to be withdrawn from said grooves through said slot such that said element can be uncoupled.

4,611,838

FLUIDTIGHT PIPE JOINT

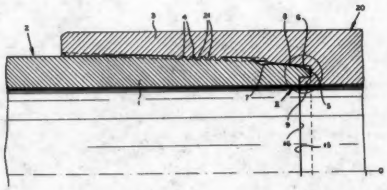
Wolfgang Heilmann, Langenfeld; Friedrich Lenze, Ratingen; Gerhard Missaire, Ruppichteroth, and Friedrich Winter, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,387

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207180; Feb. 27, 1982, 3207181; Feb. 27, 1982, 3207183

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—331 **1 Claim**



1. A pipe joint comprising:

a male metallic tubular member having a cylindrical bore and a plug-shaped first extremity formed with an annular rabbet along said bore and opening at an end face of said first extremity;

said rabbet being delimited at least by a cylindrical surface of a diameter greater than that of said bore and an inner surface lying in a plane perpendicular to an axis of said member,

said end face lying in a plane perpendicular to said axis,

said first extremity having an outwardly bowed convex outer surface extending axially rearwardly from said end face and of a diameter increasing away from said end face, and

a male helicoidal thread formed on said first extremity and spaced axially rearwardly from said outer surface of said first extremity; and

a female metallic tubular member having a cylindrical bore and a socket-shaped second extremity coaxially receiving said first extremity,

said second extremity being formed with an annular rib surrounding said bore of said second extremity,

said bore of said second extremity being flush with the bore of said first extremity of said inner surface of said first extremity,

said second extremity being formed by a recessed annular face lying in a plane perpendicular to said axis and sealingly abutted by said end face of said first extremity,

said rib having an end surface adapted to sealingly abut said inner surface of said rabbet and a cylindrical surface adapted to be sealingly surrounded by said cylindrical surface of said rabbet,

a frustoconical surface diverging outwardly from said recessed face on said second extremity and tangentially engaging said outwardly bowed surface of said first extremity for forcing said cylindrical surface of said rabbet against said cylindrical surface of said rib, and

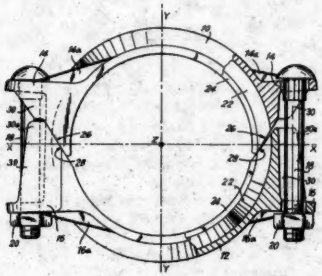
said second extremity being formed with a female helicoidal thread extending away from said frustoconical surface and engageable with said male thread upon the thread coupling of said members to effect sealing contact of said frustoconical surface with said bowed surface, of said cylindrical surfaces with each other, of said end surface of said rib with said inner surface of said rabbet, and of said end face of said first extremity with said recessed face of said second extremity.

4,611,839

SELF-ADJUSTING PIPE CLAMP AND COUPLING

Robert Rung, Hopatcong, N.J., and Lani G. Ache, Allentown, Pa., assignors to Victaulic Company of America, Easton, Pa.

Filed Jul. 12, 1983, Ser. No. 512,934
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—367 **21 Claims**



1. In a pipe coupling of the type including plural arcuate coupling segments, radially inwardly extending engagement means on each said coupling segment for clamping engagement with ends of pipe members arranged in juxtaposed relationship, radial and axial walls of each said coupling segment providing for the reception of sealing means, and means for securing said coupling members to each other in end-to-end encircling relationship about said pipes, the improvement comprising:

juxtaposed end faces on at least one pair of adjacent coupling segments positioned in sliding face engagement with each other, said end faces each being inclined at an oblique angle to the diametral X-Z plane of the coupling and extending perpendicular to the Y-Z plane of the coupling, said end faces being positioned in at least closely proximal relationship to each other upon initial assembly of the coupling onto a pipe having an external diameter which is a maximum diameter within a range of manufacturing tolerances of said pipes; and,

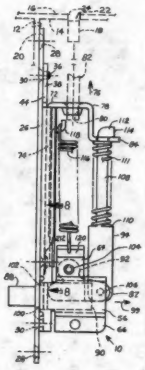
traction means operative to urge said end faces towards each other and then to slide said end faces across each other to reduce an effective internal circumferential length of an inner periphery of said coupling, thus permitting said engagement means to clamp onto and secure a pipe having an external diameter falling within said range of manufacturing tolerances.

4,611,840

DOOR CONTROL MECHANISM

Frank J. Martin, 2240 Gale Rd., Ann Arbor, Mich. 48105

Filed Mar. 28, 1984, Ser. No. 594,045
Int. Cl.[4] E05C *1/02*
U.S. Cl. 292—177 **17 Claims**



1. For use in conjunction with a pair of swinging doors mounted within a door frame opening wherein the doors have edges which come together along a common line of closure when the doors are closed, a door control mechanism adapted for mounting along the edge of one of the doors to control a latching means associated with the one door for selectively latching the one door within the door frame opening, said door control mechanism comprising first and second stamped metal members, said first stamped metal member comprising a track portion, said first member being adapted to be mounted along the edge of the one door so that the length of said track portion is parallel with that edge, said second stamped metal member comprising a slide portion adapted for connection to the latching means of the one door, said slide portion being engaged with said track portion such that said second member is guided on said first member for displacement lengthwise of said track portion, and an actuating mechanism operatively coupled with said second member for displacing said second member along said track portion, said second member comprising an arm portion projecting generally transversely of its slide portion, said actuating mechanism having an operative coupling with said arm portion for displacing said second member along said track portion, said arm portion adapted to provide for operative connection of said second member with the latching means of the one door, said actuating mechanism comprising

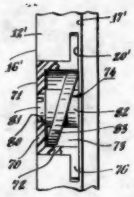
an actuating element, means for guiding said actuating element relative to said first member for displacement in a direction which is transverse to the direction of displacement of said second member on said first member, a crank disposed for operation by said actuating element, and a third stamped metal member in the form of a link operatively coupling said crank and said arm portion of said second member, said arm portion having an aperture through which said link passes, said link having a main portion between said arm portion and said crank, said main portion having a lost-motion fit through said aperture, said link having an end portion disposed beyond said aperture relative to said crank, means on said end portion having a shape which interferes with said aperture to thereby define one end limit for the lost-motion fit with said aperture, and spring bias means acting on said actuating mechanism relative to said second member to spring bias said means on said end portion into interference with said aperture and hence said link to the one end limit of the lost-motion fit with said aperture.

4,611,841

PANEL RETAINING ARRANGEMENT

Ernest Ravinet, Richmond, Ind., assignor to The Tappan Company, Mansfield, Ohio

Filed Jun. 6, 1984, Ser. No. 617,754
Int. Cl.⁴ E04C *3/04*
U.S. Cl. 292—241 **4 Claims**



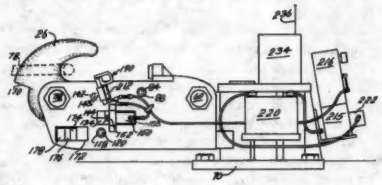
1. In a door assembly including a panel, a frame having an opening for receiving the panel, the frame being rabbeted surrounding the opening to provide a shoulder engaging said panel and inhibiting displacement of said panel in one direction from said opening, said panel having a groove in a peripheral edge thereof and directed towards said frame, said frame having a mortise adjacent said groove, and holding. means rotatably mounted in said mortise and having a projection extending into said groove only at determined angular displacements of said holding means for holding said panel to said frame; the improvement wherein said holding means comprises a solid hub having an axes and a radius, said projection comprising a spiral ramp having a substantially rectangular cross section and extending radially from said hub for substantially its entire length, the ends of said ramp terminating in a plane parallel to the axis of said hub and spaced from said axis a distance substantially equal to the radius of said hub, whereby said projection does not extend on the side of said plane opposite to said axis, further comprising an insert, one end of said insert being substantially D-shaped and having a central hole, said insert having a central portion comprised of walls extending from said one end thereof normal to a plane of said one end thereof, to define a D-shaped chamber open at the side opposite said one end of said insert and adjacent the straight portion of said one end of said insert, said insert further having a flange extending from the other end of said central portion, said mortise having a first portion for receiving said flange and a second portion abutting said central portion of said insert with said one end of said insert adjacent to the side of said frame opposite said shoulder, said hub being positioned within said chamber and having an axial extension extending into said central hole of said insert.

4,611,842

RELEASEABLE HOOK

Irving Epstein, 2901 Utah Ave. S., Seattle, Wash. 98124

Filed Sep. 17, 1984, Ser. No. 651,100
Int. Cl.⁴ B66C *1/38*
U.S. Cl. 294—82.33 **56 Claims**



1. A releasable hook comprising:
a. a frame;
b. a U-shaped hook having a hook means and a main body portion;
c. a first shaft on said frame;
d. said U-shaped hook being positioned on said first shaft;
e. said U-shaped hook and said frame being rotatable with respect to each other;
f. said hook having a locking surface;
g. a locking pawl;
h. a second shaft on said frame;
i. said locking pawl and said frame being rotatable with respect to each other;
j. said locking pawl having a locking bearing surface for engaging said locking surface of said hook to restrict movement of said U-shaped hook;
k. said locking bearing surface upon rotating away from said U-shaped hook releasing said U-shaped hook to rotate;
l. a control means for controlling the movement of said locking pawl;
m. said control means comprising an actuating unit for allowing said locking pawl to rotate to allow said U-shaped hook to rotate;
n. said actuating unit comprising a receiving means for receiving electromagnetic waves;
o. said actuating unit comprising a transmitting means for transmitting electromagnetic waves to said receiving means;
p. said transmitting means being remotely positioned from said receiving means; and,
q. said transmitting means and said receiving means operatively connecting together and being free of a physical connection.

4,611,843

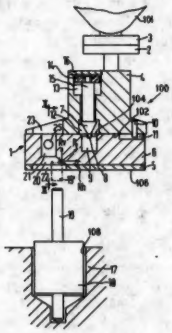
GRIPPER FOR A MANIPULATION DEVICE FOR AN INDUSTRIAL ROBOT

Rudolf Burger; Franz Kobras; Gerd Kohler; Erich Niedermayr, all of Munich, and Josef Poessinger, Ettal, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,472
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 3334967
Int. Cl.⁴ B25J *15/00*
U.S. Cl. 294—86.4 **15 Claims**

1. In a gripper for a manipulation installation particularly on an industrial robot, said gripper having a housing and clamping means for frictionally gripping a part, the improvements comprising said housing having a planar joint and a slidable member being movable along the planar joint, said clamping means including gripping means and a receiving bore in the slidable member with an axis extending transverse to the planar joint for receiving a part inserted from one side of the housing, said

gripping means including a clamping element movable transverse to the axis of the bore and into the bore to grip a part inserted into the bore; and said gripper means including locating means to shift the member for positioning the bore to receive a part including a conical centering bell in the member opening toward said one side of the housing and merging with the bore.



4,611,844

TILTING HARNESS FOR HANDLING HEAVY ROLLS

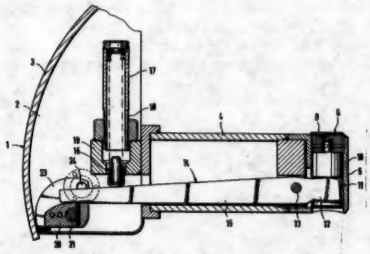
Walter Bossecker, Neustadt, Fed. Rep. of Germany, assignor to Industriewerk Nachf. Seifert & Co. KG, Neustadt, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,250

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422427

Int. Cl.[4] B66C *1/34, 1/22*

U.S. Cl. 294—86.41 **23 Claims**



1. Tilting apparatus for receiving and handling heavy spools or rolls having a core opening comprising a rolling frame means, a mandrel means on which said core opening is received, said mandrel means being mounted on said frame means, said mandrel means having a clamping jaw means which is radially movable between an extended and a retracted position, said jaw means engaging and clamping said core opening when in said extended position, jaw actuating means for actuating and moving said jaw means between said extended and retracted position, said actuating means comprising a pivotal lever pivotably mounted on said mandrel means, said actuating means further comprising spring means for applying a biasing force to said pivotal lever to urge said pivotal lever to an actuated pivotal position in which said lever moves said jaw means to said extended position, and cam means operable to terminate said application of said biasing force to said lever to permit said lever to be pivoted to a deactuated pivotal position in which said jaw means is in said retracted position.

4,611,845

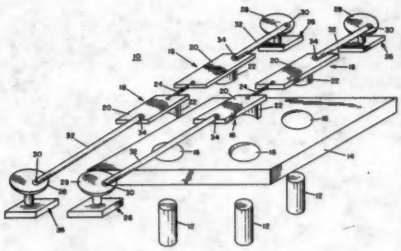
METHOD AND APPARATUS FOR PICKING UP A BATCH OF ARTICLES

John P. W. Flemming, Hopewell Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 29, 1984, Ser. No. 626,088

Int. Cl.[4] B66G *1/44*

U.S. Cl. 294—87.1 **13 Claims**



1. A method for capturing a plurality of articles arranged in an array of columns and rows, the method comprising the steps of:

positioning a plate, having a plurality of passages therethrough, to locate each article in a passage; and

selectively moving a plurality of first members, each having a first finger depending therefrom and projecting into a passage, to displace each finger to selectively capture an article between said finger and a wall of the passage.

4,611,846

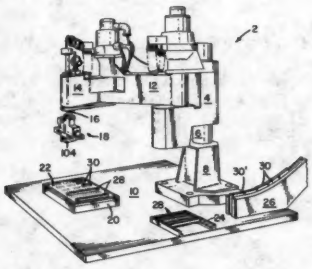
GRIPPER HEAD

Wolfgang E. A. Feiber, Harrisburg; Sammie G. Keahey, Landenberg, and James R. Kunkle, Enola, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 23, 1984, Ser. No. 663,790

Int. Cl.[4] B25B *1/02*

U.S. Cl. 294—88 **17 Claims**



1. A gripper head for use in picking up objects and placing them in predetermined positions, comprising:

a body having a central axis and means for attaching the body to a longitudinally moveable shaft, with said central axis coincident with the axis of the shaft;

first and second piston and cylinder units, arranged in the body in opposed relationship, one on each side of said central axis;

first and second jaws, one disposed on each of two opposite sides of said central axis, each jaw being connected to, and slidably drivable by, the piston of a respective one of said units, along a path of travel in a direction towards and away from said central axis, each jaw projecting from the body in a direction away from said attachment means;

a hold-down and tamper member;

means in the body for driving said member between said jaws and in a direction towards and away from said attachment means; and

means for retaining at least one of the jaws in a predetermined position along said path of travel, said retaining means being in the form of a brake, means being provided for applying the brake to the piston of one of said units.

4,611,847

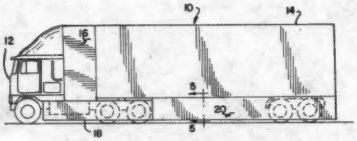
INFLATABLE AND EXTENDABLE VEHICLE SKIRT

John T. Sullivan, Fort Wayne, Ind., assignor to Navistar International Corporation, Chicago, Ill.

Filed Oct. 18, 1985, Ser. No. 789,050

Int. Cl.[4] B62D *35/00*

U.S. Cl. 296—1 S **9 Claims**



1. An extendable skirt for a highway truck comprising;

a resilient inelastic sheet having an edge secured to said truck, said sheet having a retracted position rolled up on itself about an axis parallel to said edge and a planar extended position;

retraction means operatively associated with said sheet to cause said sheet to assume said retracted position in the absence of an extending force;

elongated fluid pocket means disposed on said sheet perpendicular to said edge;

a source of pressurized fluid associated with and powered by said vehicle, and

selectively actuable control valve means connecting said pressurized fluid source with said elongated pocket means for causing said skirt to assume said extended position.

4,611,848

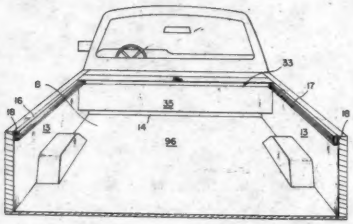
SLIDING COVER ASSEMBLY FOR OPEN BODY TRUCKS

Frank S. Romano, 7926 Shasta Court, S.E., Lacey, Wash. 98503

Filed Apr. 15, 1985, Ser. No. 723,447

Int. Cl.[4] B60J *7/10*

U.S. Cl. 296—98 **5 Claims**



1. For use in a pickup truck having an open body consisting of a flat bottom, two side walls, a front wall and a tail gage hingedly mounted to the rear end of the bottom, an improved sliding cover assembly having a pair of guide means mounted on the upper portion of the side walls of said open body, the said guide means comprising a left and a right extruded aluminum track of C-shaped cross-section having lengthwise coextensive channels communicating with the interior space of the open body, water seal means for preventing water leakage between the tracks and the side walls, cover means including a plurality of essentially planar, transversely elongated rectangular panels successively disposed adjacent to one another and extending across said open body, the said panels having end portions slidably mounted in said guide means, each panel having a first semi-cylindrical edge portion and a second semi-cylindrical edge portion having a radius larger than the radius of the first edge portion, said first edge portion being concentric with, and rotatably received by, said second edge portion of the adjacent panel, a plurality of rods, one each of said rods being inserted through each cylindrical space defined by concentric edge portions of two adjacent panels, the length of each of the rods being greater than the length of the panels thereby leaving an exposed end portion of a rod at each end of each panel, wheels rotatably mounted on the said exposed portions of each of the rods, said wheels having a diameter slightly less than the height of the channels of the tracks for rolling therewithin, whereby the panels are maintained in substantially parallel relation and the cover means is made strong and watertight, spring activated return means mounted at the forward end of said open body and connected to the forward edge portion of said cover means, and latch means mounted at the rearward edge portion of said cover means for securing said cover means in an extended position for converting said open body to a closed body, wherein the improvement comprises arranging the panels such that adjacent panels are alternately wide and narrow, thereby facilitating the winding of the cover means into a space-saving, rolled configuration.

4,611,849

CONVERTIBLE TOP WITH INTERCHANGEABLE FLEXIBLE AND RIGID REAR WINDOWS FOR A PASSENGER MOTOR VEHICLE

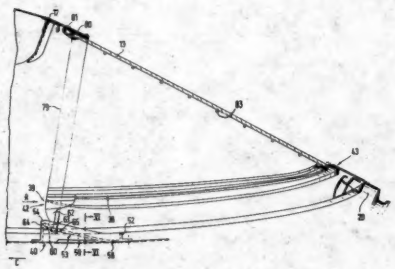
Werner Trenkler, Asperg, Fed. Rep. of Germany, assignor to Dr.Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,626

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311144

Int. Cl.[4] B60J *1/18, 7/12*

U.S. Cl. 296—201 **27 Claims**



1. A convertible top for a passenger motor vehicle having a body, comprising a top cover means including a rear wall window formed by a flexible windowpane means, and flexible windowpane means being constructed so as to be removable and interchangeable for a fixed-glass windowpane means, the fixed-glass windowpane means being provided at an edge facing the vehicle body with plural locking hook plug-in

means, one of the plural locking hook means being located relative to a vehicle longitudinal axis at one lateral side of the fixed-glass windowpane means and another of the plural locking hook means located at an opposite side of the fixed-glass windowpane means, which plural locking hook means cooperate with plural hook receiving and mounting means separately arranged on each side of the body to retain the sides of the fixed-glass windowpane to the sides of the body, disengageable locking means for retaining the fixed-glass windowpane means at the body, and the fixed-glass windowpane means being connected with adjacent body parts.

4,611,850

CLIP DEVICE FOR FIXING WINDOW GLASS IN MOTOR VEHICLE

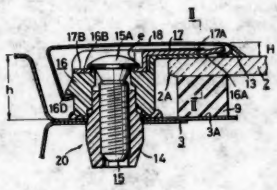
Yoshihiro Fujikawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 12, 1984, Ser. No. 680,661

Claims priority, application Japan, Dec. 14, 1983, 58-192644[U]

Int. Cl.⁴ B60J *1/02*

U.S. Cl. 296—201 **9 Claims**



1. A clip device for fixing a window glass to a motor vehicle body, comprising:

a body side clip secured to said motor vehicle body adjacent an outer peripheral edge of said window glass;

a screw threadably coupled to said body side clip, said screw including a head portion;

a clip body having an aperture for receiving said screw and being fixed to said body side clip by said screw, said clip body including a clip body forward end portion extending away from said screw and overlying the outer surface of said window glass at said outer peripheral edge, said clip body further including a clip body end face underlying said head portion of said screw, said clip body end face being offset inwardly toward said motor vehicle body relative to said clip body forward end portion;

a retainer overlying said clip body, having an aperture for receiving said screw, and being fixed to said clip body and said body side clip by said screw, said retainer including a retainer forward end portion contacting the outer surface of said clip body forward end portion and extending away from said screw farther than said clip body forward end portion, said retainer further including a retainer end face underlying said head portion of said screw, said retainer end face being offset inwardly toward said motor vehicle body relative to said retainer forward end portion, said retainer forward end portion pressing said clip body forward end portion and said window glass toward said motor vehicle body when said screw is tightened; and

a moulding covering the outer surfaces of said retainer, said clip body, and said head portion of said screw, said moulding having one end portion secured to said retainer forward end portion.

4,611,851

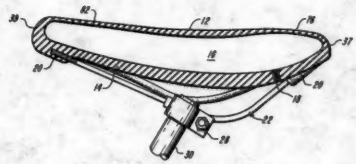
PNEUMATIC BICYCLE SADDLE

Howard B. Noyes, Harvard, and Rene Aelion, Concord, both of Mass., assignors to Tecseat Ltd., Boston, Mass.

Continuation of Ser. No. 312,248, Oct. 19, 1981. This application Dec. 11, 1985, Ser. No. 807,778

Int. Cl.⁴ B62J *1/26*

U.S. Cl. 297—199 **5 Claims**



1. A pneumatic saddle for vehicles, comprising:

a completely hollow rider-supporting shell made of a single plastic material in the shape of a bicycle saddle, said shell having a narrow forward portion, a rear portion relatively broader than said forward portion, an upper wall which constitutes the top of said shell, and a lower wall which constitutes the bottom of said shell;

said shell also including a continuous transitional zone between said upper and said lower walls, connecting them together, the thickness of said transitional zone varying gradually between the thickness of said upper wall and the thickness of said lower wall;

said shell surrounding and enclosing a chamber, and being provided with a valved aperture extending through said shell into said chamber, for introduction and maintenance of a positive pressure of gas in said chamber;

said lower wall being about 2 to 4 times as thick as said upper wall and being substantially rigid relative to said upper wall;

said lower wall possessing at least one longitudinal ridge extending the length of said shell, as well as a plurality of transverse ridges extending from said longitudinal ridge, for reinforcement;

said lower wall having a thickness of from about 0.1 to about 0.5 inches, and having on its narrow forward portion and broader rear portion a plurality of outwardly-facing sockets adapted to receive and hold supports for said shell;

said upper wall having a maximum thickness of from about 0.02 to about 0.2 inches and being flexible relative to said lower wall;

the top of the narrow forward portion of said upper wall and the broad rear portion of said upper wall being thinner than the maximum thickness of said upper wall, for rider comfort; and

means, associated with the sockets on the lower wall of said shell, for supporting said shell and connecting it to a vehicle.

4,611,852

BLEACHER BACK-REST

Paul G. Filer, Rt. #2, Box 199, Vandalia, Ill. 62471

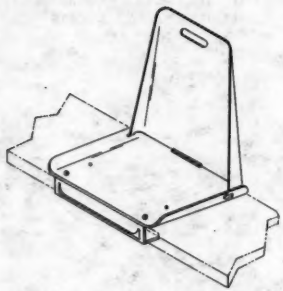
Filed Oct. 25, 1984, Ser. No. 713,321

Int. Cl.⁴ A47C *15/00*

U.S. Cl. 297—352 **1 Claim**

1. A molded seat structure comprised of three main parts; the back formed of sheet material substantially rectangular possessing tongues that extend down and frontward; the bottom formed of sheet material substantially rectangular possessing slots that correspond with the said tongues of the said back interlocking to accomodate the said tongues of the said back thereby conecting to form a seat and back structure; the third main part depending from the front of the said seat acts as an anchor securing the said structure to bleachers and the like; the

transverse slot in the said anchor receives the upper portion of the said back; the said tongues of the said back insert through



the said corresponding slots of the said seat inter-connecting the parts in a vertical knock down carrying position.

4,611,853

ARTICULATED FITTING FOR VEHICLE SEATS

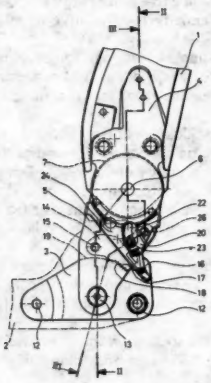
Gerhard Lehmann, and Heinz-Jürgen Wagener, both of Remscheid, Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,203

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247946

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—379 **7 Claims**



1. An articulated fitting for vehicle seats, particularly motor vehicle seats, comprising:

an upper fitting element to be connected with a back rest;

a lower fitting element to be connected with a seat portion;

and an intermediate element pivotably connected both with the upper fitting element and with the lower fitting element about a pivot axis and a lower-lying folding axis spaced apart from said pivot axis, respectively, said lower fitting element having a toothed surface and a slide surface;

an adjusting and holding device that engages the upper fitting element and the intermediate element for the adjustment of the angle of inclination of the back rest; and

a folding lock which permits a pivoting of the upper fitting element and the intermediate element about the folding axis only when in the unlocked condition;

wherein said pivot axis and said folding axis are located, when the folding lock is locked, such that a line between the pivot axis and the folding axis subtends an angle of no more than 30 degrees with a line extending vertically downward in the assembled position of the pivot axis; and

wherein a stop is provided which limits the pivot range of the intermediate element toward the rear, and the folding lock includes a detent pawl which automatically falls into a locking position only in the rear position of the intermediate row of teeth, said segment engaging with the toothed surface of the lower fitting element when the lock is locked and at least one of the teeth of the first toothed segment lies on the slide surface of the lower fitting element when the folding lock is unlocked;

whereby when the seat is folded forward, the arrangement of the folding and pivoting axes precludes the seat from interfering with the roof of the vehicle.

4,611,854

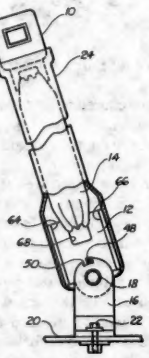
SELF-STANDING SEAT BUCKLE MOUNT FOR AUTOMOTIVE VEHICLES

Robert C. Pfeiffer, Sterling Heights, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1984, Ser. No. 652,781

Int. Cl.[4] A62B *35/00*

U.S. Cl. 297—468 **32 Claims**



1. In a self-standing seat belt buckle mount for a safety restraint system having a seat belt buckle mounted to one end of a semi-rigid member, a mounting bracket, and a pivot member pivotally connecting the mounting bracket with the other end of the semi-rigid member, wherein the improvement comprises:

a clutch plate connected to the other end of the semi-rigid member, said clutch plate having a spring engagement surface and an axial aperture circumscribing the pivot member; and

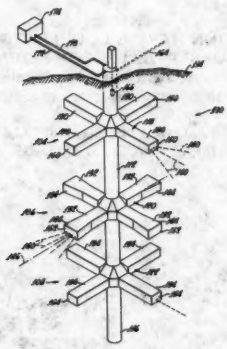
a spring member compressively disposed between said clutch plate and the mounting bracket to produce a frictional force biasing said spring member into engagement with said spring engagement surface of said clutch plate for retaining the semi-rigid member in an adjustable self-standing position.

4,611,855

MULTIPLE LEVEL METHANE DRAINAGE METHOD

Walter L. Richards, Huntington Beach, Calif., assignor to Methane Drainage Ventures, Placentia, Calif.

Continuation-in-part of Ser. No. 420,149, Sep. 20, 1982, Pat. No. 4,452,489. This application May 11, 1984, Ser. No. 609,473
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] E21C *41/10*; E21B *43/30*
U.S. Cl. 299—2 18 Claims



1. A method for collecting gas from subterranean formations having a plurality of spaced-apart seams containing said gas, said method comprising the steps of:

drilling a shaft from the earth's surface to a depth sufficient to intersect a plurality of seams containing gas to be collected;

excavating a cruciform-shaped working area at selected seams with each said cruciform-shaped working area communicating with said shaft and said selected seams;

drilling at least one borehole from each of said cruciform-shaped working areas into the seams; and,

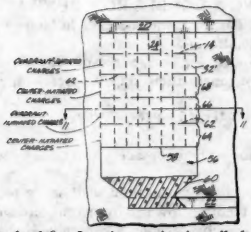
collecting gas from said borehole and conducting said gas through said cruciform-shaped working areas and through said shaft to the earth's surface.

4,611,856

TWO-LEVEL, HORIZONTAL FREE FACE MINING SYSTEM FOR IN SITU OIL SHALE RETORTS

Chang Y. Cha, and Thomas E. Ricketts, both of Bakersfield, Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 246,232, Mar. 23, 1981, abandoned, which is a continuation of Ser. No. 70,319, Aug. 27, 1979, abandoned. This application Sep. 16, 1983, Ser. No. 533,267
Int. Cl.[4] E21C *41/10*
U.S. Cl. 299—2 31 Claims



1. A method for forming an in situ oil shale retort within a retort site in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale formed within upper, lower and side boundaries of an in situ oil shale retort site, the method comprising the steps of:

excavating an undercut in a lower portion of the retort site, leaving a zone of unfragmented formation remaining within the retort site above the undercut, said zone of formation having a free face above the undercut, the undercut providing a void space toward which formation within the zone of unfragmented formation is explosively expanded for forming a fragmented mass within the upper, lower and side boundaries of the retort site, the volume of said undercut being substantially similar to the volume of the voids interspersed within the principal portion of the fragmented mass being formed with said boundaries of the retort site;

placing explosive in separate generally horizontal layers of formation within the zone of unfragmented formation; and

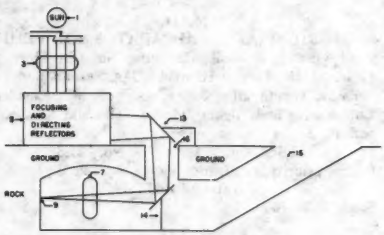
detonating such explosive in a single round for explosively expanding such laycrs downwardly toward the undercut in lifts in a plurality of sequential horizontal layers progressing upwardly from the bottom of said zone of unfragmented formation adjacent the undercut to adjacent the upper boundary of the retort site for forming a fragmented permeable mass of formation particles containing oil shale within said boundaries of the in situ oil shale retort; and in which the layers being expanded in lifts are progressively reduced thickness as the sequence of explosions progresses upwardly from one layer to the next.

4,611,857

SOLAR POWERED FOCUSING AND DIRECTING APPARATUS FOR CUTTING, SHAPING, AND POLISHING

Ivan W. Watkins, 1530 Kilian Blvd., St. Cloud, Minn. 56301

Filed Jul. 30, 1984, Ser. No. 635,445
Int. Cl.[4] E21B *7/14*
U.S. Cl. 299—14 19 Claims



1. An apparatus for focusing and directing solar energy comprising means for focusing and directing solar energy, said focusing and directing means having a real image distance, and adjusting means for enabling simultaneous adjustment of both said real image distance and said direction of focused and directed solar energy.

4,611,858

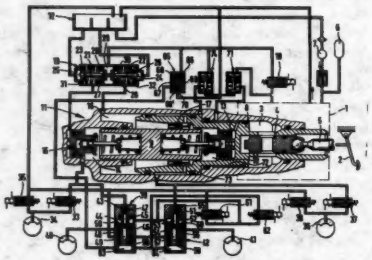
HYDRAULIC BRAKE SYSTEM

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 744,738
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422620
Int. Cl.[4] B60T *8/02, 13/12*
U.S. Cl. 303—6 R 16 Claims

1. A hydraulic brake system for automotive vehicles, which is provided with a master cylinder and a hydraulic power booster connected upstream of the master cylinder and having a pressure chamber wherein an auxiliary pressure depending on the actuating force is established by means of a pedal-operable brake valve wherein two brake circuits of the automotive

vehicle are pressurizable by the braking pressure generator which consists of the master cylinder and of the power booster wherein first valve means are provided by means of which, in dependence on the operating signals of slip control electronics, the pressure supply to the brake circuits is interrupted and pressure medium is tapped from the brake circuits, and wherein second valve means are provided which in case of control can be switched over and establish a hydraulic communication between two wheel brakes of one vehicle axle, with the wheel brakes of one brake circuit at a time being arranged



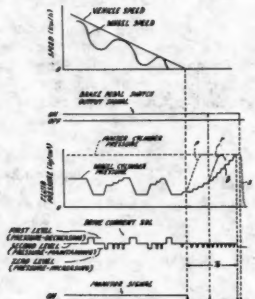
diagonally opposite at the vehicle and with the wheel brakes being connectible with the pressure chamber of the hydraulic power booster, wherein a change-over valve (39, 42) controllable by the pressure prevailing in the pressure chamber (3) of the hydraulic power booster (1) is connected at each wheel brake (40, 41) of the rear axle, with each change-over valve (39, 42) connecting diagonally opposite wheel brakes (34, 40; 36, 41) with each other in a first position and, upon pressurization, interrupting this communication and establishing a communication between two wheel brakes (40,41) of one vehicle axle.

4,611,859

ANTI-SKID BRAKING APPARATUS FOR VEHICLES

Hiromi Otsuki; Ryoichi Matsuura; Shinichi Hori; Hiroshi Fujinami, all of Anjo; Hiroyuki Oka, Susono, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 9, 1985, Ser. No. 721,392
Claims priority, application Japan, Apr. 9, 1984, 59-70623
Int. Cl.[4] B60T *8/58*
U.S. Cl. 303—100 11 Claims



6. An anti-skid braking apparatus for a vehicle, of the type arranged to control a fluid-pressure control valve provided between a master cylinder and a wheel cylinder for assuming pressure-decreasing mode, pressure maintaining mode and pressure-increasing mode in accordance with a control signal produced on the basis of wheel speed data, said anti-skid braking apparatus comprising:

(a) first means responsive to said wheel speed data for detecting whether said vehicle is moving or not; and

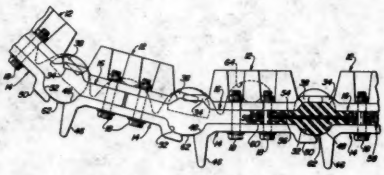
(b) second means for producing an additional control signal, in response to the detection by said first means that said vehicle has stopped, for causing said fluid-pressure control valve to shift between said pressure increasing mode and at least one of said other modes intermittently.

4,611,860

TRACK SECTION HAVING COOPERATING FLEXOR, LINK AND GROUSER DESIGN FOR REDUCING STRESS

William P. Wohlford, Bettendorf, and Nicolae V. Orlandea, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 10, 1985, Ser. No. 753,492
Int. Cl.[4] B62D *55/24, 55/28*
U.S. Cl. 305—43 1 Claim



1. In an endless track including a plurality of identical track link sections interconnected to each other, each track link section including at least one flexor, which is substantially rectangular in plan view, and includes a tensile load carrying core encapsulated in an elastomeric casing having flat, opposite end portions respectively sandwiched between respective parallel planar portions of a link and grouser of a first track link section, and between respective parallel planar portions of a link and grouser of an adjacent track link section, the improvement comprising: said casing including an enlarged portion located centrally between said flat opposite end portions; and said links respectively of the first and adjacent track link sections having adjacent ends formed by first and second sets of transversely spaced tabs arranged in overlapping relationship to each other and shaped complementary to and substantially encapsulating one side of the enlarged portion of the casing; and said grousers respectively of the first and adjacent track link sections having adjacent ends terminating close to each other and provided with respective surfaces shaped complementary to and cooperating to substantially encapsulate a second side of the enlarged portion of the casing opposite from the one side.

4,611,861

LINEAR MOTION ROLLING CONTACT BEARING HAVING A DOUBLE ROW RUNWAY

Akira Haruyama, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

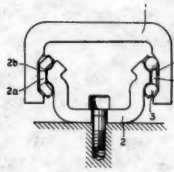
Filed Oct. 17, 1985, Ser. No. 788,317
Claims priority, application Japan, Oct. 18, 1984, 59-156357[U]
Int. Cl.[4] F16C *29/04*
U.S. Cl. 384—49 8 Claims

1. A linear motion rolling contact bearing assembly comprising:

an elongated rail having a bottom wall and a pair of inner side walls extending upward from opposite sides of the bottom wall thereby defining a generally U-shaped cross section, each of said inner side walls including a first curved section defined at its outer surface and provided

with a pair of upper and lower first guide surfaces on opposite slopes of said curved section;

a table having a top wall and a pair of outer side walls extending downward from opposite sides of the top wall thereby defining a generally U-shaped cross section, each of said outer side walls being partly located opposite to the corresponding one of said pair of inner side walls and including a second curved section defined at its inner surface and provided with a pair of upper and lower second guide surfaces such that each of said pair of second



guide surfaces is located opposite to the corresponding one of said pair of first guide surfaces;

a plurality of rolling members interposed between and in rolling contact with each pair of oppositely located first and second guide surfaces; and

retaining means interposed between said inner and outer side walls for retaining said plurality of rolling members interposed between said upper first and second guide surfaces and said plurality of rolling members interposed between said lower first and second guide surfaces in position.

4,611,862

Patent Not Issued For This Number

4,611,863

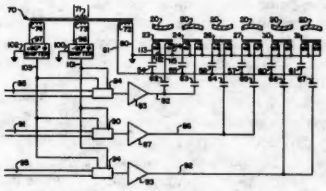
MAGNETICALLY SUPPORTED AND TORQUED MOMENTUM REACTION SPHERE

William H. Isely, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 25, 1983, Ser. No. 516,819

Int. Cl.[4] F16C *39/06*

U.S. Cl. 310—90.5 **2 Claims**



1. Angular momentum exchange apparatus comprising, in combination:

a massive rotor of substantially spherical configuration having at least an outer surface of electrically conductive and easily magnetized material;

a housing for said rotor;

drive means carried by said housing for cooperation with said surface to cause angular acceleration of said rotor about each of a plurality of axes; and

means supporting said rotor in said housing for rotation free from contact therebetween, the drive means and the last named means comprising a plurality of pairs of laminated sectors located at opposite ends of mutually orthogonal diameters of said housing, each sector carrying a centering winding and a torquing winding, the torquing windings being positionally related to the centering windings of the sectors of each pair so as to cause rotation of said rotor about a different one of said axis in either of two opposite directions depending on the phase relation between the voltages energizing said windings, and further comprising capacitors, in series with said centering windings, having capacitive reactances of said centering windings, at the frequency of energization thereof, when the rotor is centered in the house.

4,611,864

RECEPTACLE FOR MEMORY CASSETTE

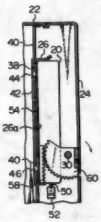
Takashi Yokota, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,462

Claims priority, application Japan, Apr. 15, 1982, 57-62977

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—12 **12 Claims**



1. A receptacle for detachably receiving a memory cassette, comprising:

a housing for accommodating the memory cassette;

a cover member movable between an open position for loading and unloading the memory cassette and a closed position relative to said housing;

a holder member for reciprocation interlocked with the movement of said cover member to hold the memory cassette;

means for driving the holder member in a reciprocal movement between a first position when the cover member is in the open position and a second position position when the cover member is in the closed position; and

a connector member for receiving and electrically connecting to terminals projecting from the lower end of the memory cassette only when the cover member is in the closed position.

4,611,865

DISPLAY STAND

Bryan E. Daws, Phoenix, Ariz., assignor to Phoenix Newspapers, Inc., Phoenix, Ariz.

Filed Jan. 30, 1984, Ser. No. 574,846

Int. Cl.[4] A47F *3/00*

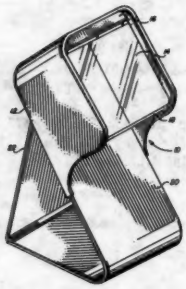
U.S. Cl. 312—114 **19 Claims**

1. A display stand for holding and displaying a plurality of periodicals, comprising:

a means for holding said plurality of periodicals, said means including: (a) a generally u-shaped hood means for providing a top wall member means and at least two side member wall means, (b) a backside means for securing to an open rear formed by said u-shaped hood means and (c) a bottom plate means for securing to an open bottom formed by said u-shaped hood means, suitable for providing said holding means to have an open front opposite said backside;

a closable means rotatably mounted onto said open front suitable for exposing said open front for permitting placement of said plurality of periodicals into said holding means and onto said bottom plate and for permitting removal of said plurality of periodicals from said holding means, said closable means rotatably including a lid operably hingedly secured to a hinged top portion, said hinged top portion operably secured to said generally u-shaped hood; and

an inclined support means for supporting said periodicals, said closable means and said holding means and for inclining said holding means so that said bottom plate makes an acute angle with a horizontal plane in order to keep said



lid shut and to prevent said periodicals from falling out of said holding means, said support means including a straight support operably secured to an angled support, said angled support being operably secured to said holding means.

4,611,866

TELESCOPING DISPLAY CANOPY

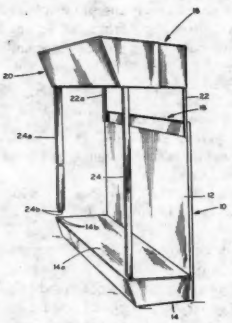
Lynn E. Everett, New Philadelphia, Ohio, assignor to Tusco Manufacturing Company, Gnadenhutten, Ohio

Continuation of Ser. No. 510,628, Jul. 5, 1983, Pat. No. 4,541,675, which is a continuation-in-part of Ser. No. 285,542, Jul. 21, 1981, abandoned. This application Sep. 3, 1985, Ser. No. 771,780

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.[4] A47B *45/00*

U.S. Cl. 312—257 R **2 Claims**



1. A canopy for installation on a product display gondola having a bottom shelf and a back panel extending vertically upward from the rear side of the bottom shelf, said canopy comprising:

(a) a mounting means having a first portion attached to a top horizontally extending marginal edge of the back panel and a second portion;

(b) a header assembly disposed above the display gondola and comprising a rear panel, a front panel and two end panels which are interconnected to form a ring-like structure, said end panels having front and rear telescoping flange sections each including corresponding upper and lower horizontally extending flanges, at least one of the upper and lower corresponding flanges being provided with a row of apertures aligned with one another and means for locking said telescoping sections in desired positions relative to each other;

(c) means for attaching the rear edges of said end panels to said second portion of said mounting means; and

(d) means for supporting the opposite ends of said end panels from the bottom shelf of the display gondola.

4,611,867

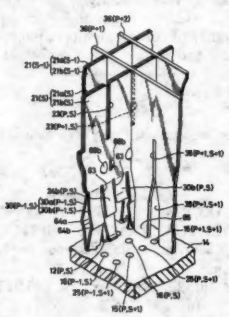
COAXIAL MULTICORE RECEPTACLE

Yoshiaki Ichimura; Hiroshi Endoh; Yoshihiko Saruwatari, and Kouzou Uekido, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited and NEC Corporation, both of Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,690

Int. Cl.[4] H01R *4/66, 23/26*

U.S. Cl. 339—14 R **18 Claims**



1. A coaxial multicore receptacle comprising:

a substrate made of insulating material,

a plurality of gorund pins set upright and arranged in a matrix pattern of rows and columns in said substrate,

a plurality of signal pins set upright on the same side of said substrate as that of said ground pins, each of said signal pins being located at about the center of a unit square area that is defined by two adjacent rows and two adjacent columns of said ground pin matrix pattern,

a plurality of first metallic lattice boards provided in parallel to one another at equal intervals substantially perpendicularly to said substrate, each of said first lattice boards being positioned above a corresponding one of the columns of said gorund pins,

a plurality of second metallic lattice boards provided in parallel to one another at equal intervals substantially perpendicularly to said substrate and crossing substantially orthogonally said first lattice boards, each of said second boards being positioned above a corresponding one of the rows of said ground pins,

coaxial contact insertion holes being defined and surrounded by said second lattice boards and said first lattice baords, which correspond one-to-one to said signal pins, and

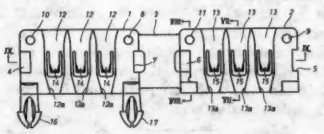
ground pin contact springs extending from each of said first lattice boards toward said substrate for elastic contact with the ground pins in the column respectively corresponding to said first lattice board.

4,611,868

LEAD WIRE HOLDER

Kazuhiro Matsui, Toyoake; Hideo Wada; Yoshihito Nakano, both of Yokohama, and Toshihiro Hayashi, Nagoya, all of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Dec. 13, 1984, Ser. No. 681,127
Claims priority, application Japan, Dec. 16, 1983, 58-238400
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—59 M 11 Claims



1. A lead wire holder comprising:

(a) a first holding member having an inside surface, an outside surface, a top surface, a bottom surface, a first end, and a second end;

(b) a second holding member having an inside surface, an outside surface, a top surface, a bottom surface, a first end, and a second end,

(c) a flexible hinge member joining the first end of said first holding member to the first end of said second holding member such that the inside surface of said first holding member can be brought into engagement with the inside surface of said second holding member;

(d) at least one mounting leg formed on the bottom surface of one of said first holding member and said second holding member, said at least one mounting leg being adapted to mount the lead wire holder by insertion into a mounting hole;

(e) a plurality of recesses formed in the inside surfaces of said first and second holding members and extending from the top to the bottom surfaces of said first and second holding members, said recesses being sized, shaped, and positioned so that, when the inside surface of said first holding member has been brought into engagement with the inside surface of said second holding member, each recess on said first holding member mates with a corresponding recess on said second holding member to form a through hole leading from the top surface of said first and second holding members to the bottom surfaces of said first and second holding members, said through holes having cross-sectional dimensions which decrease monotonically from the top surface of said first and second holding members to the bottom surfaces of said first and second holding members;

(f) a plurality of elastic tongues formed in said first holding member, one of said plurality of elastic tongues projecting into each one of said plurality of through holes in position to resiliently engage and hold a lead wire inserted into said through hole; and

(g) a plurality of elastic tongues formed in said second holding member, one of said plurality of elastic tongues projecting into each one of said plurality of through holes in position to resiliently engage and hold a lead wire inserted into said through hole,

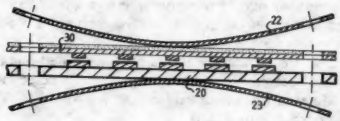
whereby coated lead wires of varying diameters can be inserted into said through holes from the top surfaces of said first and second holding members, the coatings on the coated lead wires will abut against the walls of the through holes at different points depending on the diameters of the lead wires, the lead wires will be held in said through holes by said elastic tongues, and the uncoated cores of the lead wires extend out from said through holes at the bottom surfaces of said first and second holding members.

4,611,869

CLAMPING DEVICE

Jean Bonnefoy, Crespieres, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 2, 1981, Ser. No. 326,818
Claims priority, application France, Dec. 5, 1980, 80 25858
Int. Cl.[4] H01R *13/621*
U.S. Cl. 339—75 MP 17 Claims



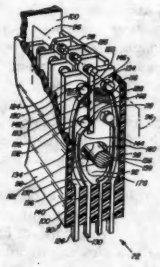
1. Clamping apparatus for uniformly exerting a predetermined force on superimposed elements of first and second groups of elements, the elements of each group being arranged to extend along a line, the apparatus comprising first and second clamping means for clamping the superimposed elements of said groups therebetween, and two force adjusting means disposed at the extremities of the clamping means, the two force adjusting means being spaced by a predetermined length and adapated to exert on the clamping means at each extremity thereof a preselected clamping force, said first clamping means possessing, in an unclamped, unconstrained state, a cambered shape with respect to the line along which the elements extend, said cambered shape being equivalent to the elastic deformation shape assumed by a beam of uniform cross-section having initially a shape corresponding to the shape of said line and mounted on two supports spaced said predetermined length upon the beam being uniformly loaded along this length by a total force corresponding substantially to double that of the said clamping force applied to each extremity, so that the deformation of the first clamping means in response to the clamping force of said force adjusting means causes said first clamping means to assume the shape corresponding to said line and to exert uniformly said predetermined force on each of the elements of each group to clamp said elements together.

4,611,870

MANUALLY OPERATED ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

Howard L. Beers, Cape Coral, Fla., assignor to Tritec, Inc., Naperville, Ill.

Filed Aug. 13, 1984, Ser. No. 639,831
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—75 MP 22 Claims



1. A manually operated connector for connecting a plurality of spaced printed terminals located on a printed circuit board with a plurality of corresponding output leads carried by said

connector in order to connect the terminals with other parts of the electrical system with which the printed circuit board is used, said plurality of printed terminals being arranged in a predetermined pattern comprising at least two rows of terminals oriented adjacent and parallel to a first edge of said circuit board, which connector comprises:

(a) a plurality of output leads equal in number to said plurality of printed terminals;

(b) a plurality of contacts equal in number to said plurality of printed terminals and arranged in at least two rows forming a pattern that is the mirror image of said predetermined pattern of printed terminals, each of said contacts having:

(i) a free end associated with a predetermined one of said printed terminals and electrically connected with a predetermined one of said output leads,

(ii) an open position, and

(iii) a closed position for contact with its associated printed terminal;

(c) a narrow hollow body formed of rigid, insulative material for housing said contacts and for carrying said output leads fixedly attached to said connector body and extending outward therefrom, said body having a median plane and two main walls parallel to said plane which are connected by two narrow walls, said walls together defining the interior of said connector body and defining an opening for receiving said printed circuit board,

said circuit board when inserted by the user of the connector in said board-receiving opening being guided through a predetermined path into an operative position within the interior of said body in which position said board is disposed generally parallel to said main walls and in which each of said printed terminals of said at least two rows is in position to make contact only with its associated contact in the electrical connector,

(d) resiliently deformable, elongated support means for each of said plurality of contact, each of said support means:

(i) normally supporting its respective contact in the contact's open position, and

(ii) being insulated, together with its associated contact, from the other contacts and the latter's associated support means;

(e) actuator means for each of said resiliently deformable support means, each of said actuator means being positioned to deform the support means with which it is associated to urge its respective contact, in a direction generally normal to said median plane, into its said closed position;

(f) means for operating all said actuator means, said operating means having an open, inoperative position and a closed operative position,

said means for operating said actuator means comprising movable carriage means positioned alongside its associated elongated support means to move longitudinally thereof and supporting at least one of said actuator means, at least one of said actuator means comprising a rigid pin formed of insulative material extending perpendicularly from said carriage means in a direction transverse to its associated elongated support means,

said carriage means lying entirely outside said predetermined path followed by said printed circuit board when said board is inserted in said connector body and is moved along said path to its said operative position,

said carriage operating means having a cam follower surface;

(g) manually controlled means other than said printed circuit board for urging said operating means to operate said actuator means, said urging means having an open, inoperative position and a closed, operative position,

said manually controlled urging means comprising cam means movably secured to said connector body, said cam means being shaped to contact said cam follower surface and thereby urge said operating means, when said manually controlled urging means is moved from its open position to its closed position, to operate said actuator means; and

(h) locking means for preventing said operation of the actuator means until after said printed circuit board with its at least two rows of terminals oriented adjacent and parallel to a first edge of said circuit board has been inserted in said board-receiving opening and, while said contacts are held by their respective support means in their normal open positions, said board has been moved along said predetermined path to its said operative position in which each of said printed terminals of said at least two rows is in position to make contact only with its associated contact of the electrical connector;

whereby all contact between said contacts and said printed terminals is avoided unless the printed circuit board has been inserted within the connector and has been moved into its said operative position.

4,611,871

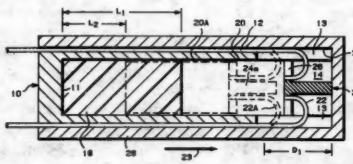
SHOCK MOUNT

Edgar J. Abt, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1981, Ser. No. 236,952

Int. Cl.[4] H01R *33/975*

U.S. Cl. 339—93 C **9 Claims**



1. A mount for protecting a relatively fragile device during application of a shock pulse, comprising in combination:

protective means for enclosing the fragile device, said protective means having an internal cavity with at least one internal surface portion, the fragile device being located within said internal cavity;

non-resilient compressible means for attenuating the shock pulse, said means for attenuating being selected to be non-resilient and compressible relative to the fragile device said non-resilient means being located within said internal cavity between the fragile device and said internal surface portion, said internal surface portion being oriented with respect to the fragile device such that the application of the shock pulse on the fragile device urges the fragile device toward said internal surface portion whereby said nonresilient means is crushed from an initial volume to a crushed volume by said fragile device to attenuate the effect of the shock pulse on the fragile device; and

bendable means for providing slack in an external signal linkage, said bendable means being coupled to the fragile device, said bendable means having at least one looped portion.

4,611,872

WATER-PROOF CONNECTOR

Katsuya Ito, Yokkaichi, and Shinichi Yamada, Kanazawa, both of Japan, assignors to Tokai Electric Wire Company Limited, Japan

Filed Aug. 23, 1984, Ser. No. 643,641

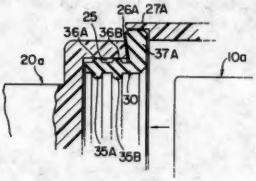
Claims priority, application Japan, Sep. 21, 1983, 58-147120[U]; Sep. 21, 1983, 58-147121[U]

Int. Cl.[4] H01R *4/00*

U.S. Cl. 339—94 M **9 Claims**

1. A water-proof connector comprising a seal ring in a coupling between a first connector housing with a first connector

and a second connector housing with a second connector, wherein said seal ring includes a cylindrical portion and an engaging portion, said cylindrical portion including annular protrusions, said engaging portion including at least two engaging protrusions, seal ring stopper slots extending through said first connector housing for engaging the engaging protrusions of said seal ring, said engaging protrusions of said seal ring being retained within said seal ring stopper slots of said



first connector housing while said first connector housing is inserted into said second connector housing with said annular protrusions of said seal ring being compressed between said connector housings when assembled for water-proofing purpose, said first connector housing having protecting members overlying at least in part said seal ring stopper slots and sealingly engaged by said seal ring engaging protrusions when said connector housings are assembled for further improving water-proofing sealing.

4,611,873

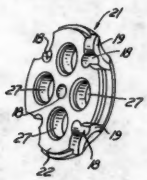
INSERT ASSEMBLY FOR A CONNECTOR

Stephen Punako, Bainbridge, and David O. Gallusser, Oneonta, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 16, 1984, Ser. No. 571,300

Int. Cl.⁴ H01R *4/00*

U.S. Cl. 339—94 M **14 Claims**



1. In combination with a connector of the type having a tubular metal housing, an insert assembly and means for mounting said insert assembly within said tubular housing, the improvement wherein the insert assembly comprises:

a planar metal member having a front face and a rear face, said metal member in electrical contact with said housing, having a plurality of axially extending bores, and having void means extending substantially parallel to the central axis of said planar metal member for receiving portions of a planar plastic member;

a planar plastic member having a rear face and a front face molded to the rear face of the metal member and having portions extending from said front face and into said void means thereby enhancing mechanical connection of the planar plastic member to the planar metal member, said plastic member having a plurality of axially extending and axially aligned bores coextensive respectively with said bores of said planar metal member for receiving a respective insertable terminal within, which extends from each of said coextensive planar metal member bores and said planar plastic member bores, in a manner such that each terminal is electrically connected to said tubular metal housing through said planar metal member; and

means for retaining a respective terminal in each of the bores in said planar members so that each terminal is in electrical contact with said metal planar member.

4,611,874

DEVICE FOR MAKING LSA-PLUS CONTACT WITH CONDUCTOR WIRES OF DIFFERENT TYPES AND SIZES

Dieter Gerke; Horst Forberg, and Wolfgang Radelow, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

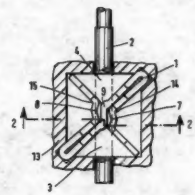
Continuation of Ser. No. 449,457, Dec. 13, 1982, abandoned.

This application Mar. 25, 1985, Ser. No. 715,582

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207186

Int. Cl.⁴ H01R *4/02*

U.S. Cl. 339—97 R **12 Claims**



1. A terminal for terminating an elongated electrical conductor having insulation therearound, said terminal being formed of leaf-shaped resilient contact material having a slot forming a polytropic air gap for making solderless, non-screwed and non-stripped contact with the conductor, said terminal comprising:

first and second members, each having:

a body portion with an inner longitudinal slot wall;

a single cutting lance at the top of said slot wall; and

a centering edge sloping generally upward from said cutting lance to the top of said body portion;

said first and second member being arranged to form said slot as a top opening gap between said slot walls and being resiliently joined below said slot, said cutting lances being in offset confronting relationship, said centering edges forming a V-shaped centering portion for guiding the conductor onto said cutting lances and into said slot between said slot walls, said slot being oriented perpendicularly with respect to the axis of the conductor, said cutting lances attached to said slot walls defining an axis perpendicular to the insertion axis of the conductor;

whereby upon insertion of the conductor into said centering portion, said cutting lances rip open the conductor insulation at offset locations along the conductor axis and defining a wedge-like space relative to each other facilitating the insulation cutting operation, said slot walls flex laterally, perpendicular to the insertion axis of the conductor to accommodate the conductor in said slot, said slot walls gripping said conductor at a location remote from said cutting lances at a bottom portion of said slot, wherein the size of the conductor, the width of said slot and the resilience of said slot walls determine the contact pressure of said terminal on the conductor.

4,611,875

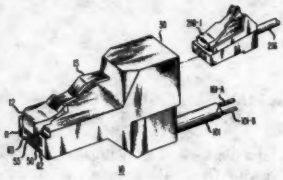
COMMUNICATION SYSTEM CROSS-CONNECT FIELD POWER ADAPTER

John E. Clarke, Colts Neck, N.J.; Edwin C. Hardesty, Perry Hall, Md., and George W. Reichard, Jr., Carmel, Ind., assignors to AT&T Information Systems, Holmdel and AT&T Technologies, Berkeley Heights, both of, N.J.

Filed Aug. 23, 1984, Ser. No. 643,446

Int. Cl.[4] H01R *13/50*

U.S. Cl. 339—154 A **6 Claims**



1. An adapter for use in a communication system cross-connect field between the jack end of a communication path and the plug end of a cross-connect cord, said adapter arranged for connecting an auxiliary cord carrying specific signals having at least two conductors to said communication path so that said specific signals can be added to signals on said communication path without interference with said communication path signals, said adapter comprising

a first end having a jack for mating with said plug of said cross-connect cord, said jack having a number of electrical contacts n equal to the number of electrical contacts of said cross-connect plug,

a second end opposite said first end having a plug for mating with said jack end of said communication path connection, said plug having a number of electrical contacts greater than n for also mating with electrical contacts of said jack and of said communication path,

means located at said first end and below said jack for accepting said auxiliary cord having multiconductors and for presenting said conductors of said auxiliary cord to said second end, said means including channels connecting said first end of said plug to said second end, each said channel formed to receive one of said conductors of said auxiliary cord,

said second end having means for securing ones of said conductors presented from said first end via said channels, said securing means forming a portion of said contacts at said second end and said auxiliary cord conductors establishing a separate electrical path through said adapter for carrying said specific signals.

4,611,876

GENERAL PURPOSE LOSS-PROOF TERMINAL FOR FORMING ELECTRIC CONNECTIONS BY CLAMPING BETWEEN TWO CONDUCTING ELEMENTS

Claude Barrabès, Cauge, France, assignor to La Telemecanique Electrique, France

Filed Dec. 26, 1984, Ser. No. 686,558

Claims priority, application France, Dec. 30, 1983, 83 21084

Int. Cl.[4] H01R *4/30*

U.S. Cl. 339—263 R **7 Claims**

1. A loss proof general purpose terminal for forming electric connections by clamping between two conducting elements, this terminal comprising:

an insulating material body;

a recess formed in said body and having guiding walls;

a connection plate disposed at the bottom of said recess;

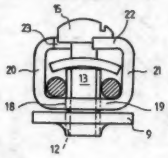
a central bore formed in said connection plate;

Female screwing means formed in said central bore and having a screwing axis which extends parallel to said guiding walls;

a clamping screw mounted for passing through said bore and for being screwed into said screwing means, said clamping screw having a head, a thread portion and a smooth intermediate shank portion between said head and said thread portion;

a stirrup element having a bore through which passes said intermediate shank portion, said stirrup element being mounted on said intermediate shank portion;

a mobile assembly comprising a stirrup plate having a threaded bore through which said clamping screw is screwed, said stirrup plate having guiding surface portions cooperating with said guiding walls;



retaining means fitted on said stirrup plate and having an abutment surface portion against which the stirrup element comes to bear after unscrewing of said clamping screw from the connection plate, so that the clamping screw which is then still screwed in the threaded bore of the stirrup plate remains fixedly attached to said mobile assembly and is maintained, due to the cooperation of said guiding walls and said guiding portions, substantially coaxial with said screwing axis, whatever the position of said mobile assembly inside said recess.

4,611,877

OPTICAL PROJECTORS FOR HEAD UP DISPLAYS

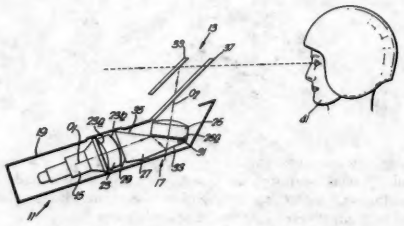
Stafford M. Ellis, West Sussex, England, assignor to GEC Avionics Limited, England

Filed Aug. 9, 1985, Ser. No. 763,965

Claims priority, application United Kingdom, Aug. 31, 1984, 8422033

Int. Cl.[4] G02B *27/14*

U.S. Cl. 350—174 **5 Claims**



1. An optical projector comprising a luminous data source and means for projecting and collimating light from the data source comprising a first lens arrangement having an optical axis arranged to receive light from the data source, a second lens arrangemnt having an optical axis inclined with respect to the optical axis of the first lens arrangement, and reflector means between the first and second lens arrangements arranged to deflect rays from the first lens arrangement to the second lens arrangement for transmission thereby, the reflector means comprising a body of light refractive material having a light input face via which light enters the body from an output surface of the first lens arrangement and two further faces which define a wedge-shaped portion of the body extending across a light input surface of the second lens arrangement, one of said two further faces having a mirror coating thereon and

the wedge angle and orientation of the wedge-shaped portion of the body being such that light entering the body from the first lens arrangement undergoes critical angle reflection at the other of said two further surfaces to the said one further face from whence, after reflection, it is transmitted, without substantial reflection, by the said other further face to the second lens arrangement for transmission thereby.

4,611,878

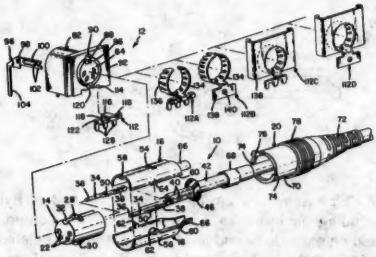
ELECTRICAL PLUG CONNECTOR

Lawrence A. Hall, Harrisburg; Linn S. Lightner; William B. Long, both of Camp Hill; Suel G. Shannon, Harrisburg, and Daniel E. Stahl, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 462,278, Jan. 31, 1983, Pat. No. 4,493,525. This application Jan. 15, 1985, Ser. No. 691,620

Int. Cl.[4] H01R *13/629, 23/06*

U.S. Cl. 339—186 M **5 Claims**



1. A plug connector for electrical connection to insulated electrical conductors and a shield of a shielded cable and being matable in a polarized relationship with a receptacle connector having an outwardly facing axially disposed channel extending peripherally rearwardly from the mating face thereof, said plug connector comprising:

dielectric housing means having terminal passageways extending therethrough, said terminal passageways having stop surfaces therein, said housing means having recess means therein;

electrical terminal means having contact means, conductor-securing securing means and latching means, said conductor-securing means being securable to the electrical conductors and thereafter being positioned in said terminal passageways with said latching means engaging said stop surfaces thereby latchably securing said electrical terminal means in said housing means such that said contact means extend outwardly from a forward end of said housing means and said conductor-securing means are disposed within said terminal passageways;

outer contact means for disposition on said housing means and having forward section means surrounding said contact means, and further having rear section means in the form of a substantially annular section onto which an end of the shield is to be disposed;

ferrule means positionable onto said annular section over the shield end and being crimpable thereonto electrically connecting the shield end between the annular section and said ferrule means; and

insulating sleeve means having contact-engaging means and cable-engaging means, said contact-engaging means being positioned onto said outer contact means and said cable-engaging means being profiled for engaging the cable adjacent said ferrule means;

said outer contact means including an inwardly directed projection means extending axially rearwardly from the front edge of said forward section means, and said forward section means being continuous at said projecton means; and

said outer contact means being secured onto said housing means with said projection means being in alignment with said recess means of said housing means, whereby said housing means is polarized with said receptacle connector when said projection means is disposed within said channel of said receptacle connector upon mating therewith.

4,611,879

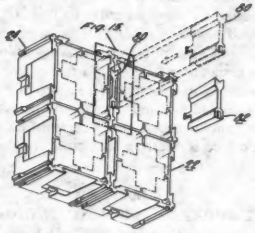
MODULAR BLOCK AND ELECTRICAL INTERFACE ASSEMBLIES EMPLOYING SAME

Peter H. Bullard, Skippack, Pa., assignor to Dill Products Incorporated, Norristown, Pa.

Filed Jul. 31, 1984, Ser. No. 636,148

Int. Cl.[4] H01R *9/22*

U.S. Cl. 339—198 H **18 Claims**



17. An interface board comprising a plurality of modular blocks each having a front face, a rear face and four side faces, each of said blocks having at least one set of integral locking elements on at least one of its side faces engaging another identical set of locking elements on another of said blocks, each of said sets of locking elements comprising lands and grooves for preventing relative lateral motion of adjacent blocks along a direction perpendicular to said lands and grooves, said lands and grooves forming first and second abutment means for preventing relative motion of adjacent blocks along directions parallel to said lands and grooves, each side face of each of said blocks comprising a tapered dovetail mortise for slidingly receiving one tenon of a double-sided dovetail wedge, said wedge comprising two dovetail tenons, one at each of its opposite sides, one of said tenons extending into the mortise on one of said blocks and the other tenon extending into the mortise of an adjacent block to prevent relative motion of said one block and said other block from each other.

4,611,880

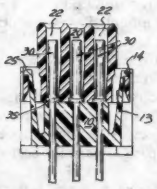
MULTIPIECE ELECTRICAL CONNECTOR

Carl C. Petersen, Binghamton; Richard W. Normann, Otego, and Paul D. Niles, Bainbridge, all of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 16, 1984, Ser. No. 600,236

Int. Cl.[4] H01R *13/514*

U.S. Cl. 339—206 R **4 Claims**



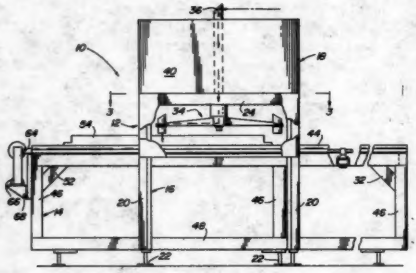
1. A multipiece electrical connector comprising: a laterally elongated one-piece dielectric housing having a plurality of sections, each section having a plurality of passages having an

axis perpendicular to the lateral axis of the elongated housing, a plurality of dielectric segments each being disposed in a respective section of said housing and each having a plurality of passages aligned with respective passages in said housing, a plurality of electrically conductive contacts each having a first portion disposed in a respective passage of one said housing section, a second portion disposed in a respective passage of one said segment associated with that section, and an enlarged portion captivated between its segment and housing section, and means for mounting each said segment to said housing section so that the enlarged portion of each said contact is mounted within said connector, characterized by said housing having its respective passages terminating on a generally flat top face and including at least one resiliently deflectable finger on at least side of each section, said fingers extending in the same general direction as the axis of said passages, each finger including a flange portion at the end thereof extending in a direction generally perpendicular to the axis of said passage, and each said segment having its passages terminating on a substantially flat bottom face and having at least one shoulder engaging a respective flange on a respective finger to secure each segment to its respective section of said housing, the passage of one said housing section and its associated segment defining an annular recess receiving said enlarged portion so that said top face is abutting said bottom face.

4,611,881
OPTICAL APPARATUS FOR SCANNING RADIATION OVER A SURFACE

Erick Schmidt; Leonard E. Grenier, and Steven Pallagi, all of Edmonton, Canada, assignors to General Systems Research, Ltd., Alberta, Canada

Filed May 20, 1985, Ser. No. 736,005
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—6.9 **21 Claims**



1. Optical apparatus for scanning a beam of radiation over a surface, comprising:

a rigid reflector support assembly,

a plurality of regularly spaced arms extending from a central axis, said arms being rotatably mounted on said reflector support assembly,

motive means for rotating said arms about said central axis,

a central reflector mounted at said central axis and rotatable with said arms,

a reflector fixed on each of said arms at a radial distance remote from said central axis,

said central reflector being positioned to fold an optical radiation beam path toward said remote reflectors, and said remote reflectors being positioned to fold the optical radiation beam path toward the surface of the object to be scanned,

mounting means for said central reflector including central reflector rotating means for turning said central reflector about the central axis relative to said remote reflectors,

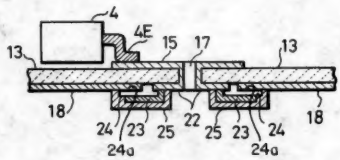
said central reflector turning means including means to index said central reflector in a direction counter to the direction of rotation of said remote reflectors and sequentially into optical path alignment with each remote reflector prior to that remote reflector traversing a predetermined arcuate segment of rotation,

whereby a beam of radiation in the optical path is effectively scanned over a predetermined arcuate segment by each of the remote reflectors.

4,611,882
HIGH-FREQUENCY CIRCUIT DEVICE WITH AN ANNULAR CAPACITOR ON THE BACK OF AN INSULATED SUBSTRATE

Susumu Ushida, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 8, 1983, Ser. No. 530,237
Claims priority, application Japan, Sep. 8, 1982, 57-136313[U]
Int. Cl.⁴ H01L *39/02*; H01G *1/005*
U.S. Cl. 357—80 **1 Claim**



1. In a high-frequency circuit device composed of hybrid ICs, including an insulated substrate, an active component fabricated on one side of said insulated substrate and including a ground terminal for grounding high-frequency signal components, a first electrode fabricated on said one side of said insulated substrate and connected to said ground terminal, a ground conductor on said insulated substrate, and a capacitor connected between said first electrode and said ground conductor,

the improvement comprising said ground conductor being fabricated on the other side of said insulated substrate, said capacitor being formed by an annular dielectric body having a peripheral surface thereof in contact with said ground conductor, a hole formed through said insulated substrate positioned substantially in the center of said annular dielectric body, a second electrode fabricated on said other side of said insulated substrate in confronting relation to said ground conductor across said annular dielectric body and connected to said first electrode through said hole in said insulated substrate, whereby high-frequency signal components of said active component are grounded through said ground terminal connected to said first electrode and through said hole to said second electrode, said annular dielectric body, and said ground conductor.

4,611,883
TWO-DIMENSIONAL OPTICS ELEMENT FOR CORRECTING ABERRATIONS

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 261,315, May 1, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 551,731
Int. Cl.⁴ G02B *6/12*
U.S. Cl. 350—96.12 **12 Claims**

1. An optical element for adjusting the effective focal length of a planar geodesic lens system, said lens system comprising:

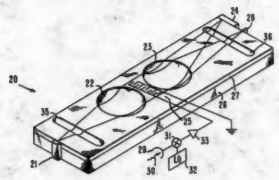
a substrate;

a diffused planar surface layer on said substrate, said surface layer conforming to the contour of said substrate and being transmissive of optical radiation and having a source end, for receiving input optical radiation and a detector

end, for transmitting optical radiation traversing said surface layer;

at least one spherical depression in said substrate, with said surface layer following said at least one spherical depression in said substrate so as to form at least one geodesic lens in said surface layer, said at least one geodesic lens being shaped so that a substantial portion of the optical radiation passing through said planar surface layer from said source end toward said detector end is focussed by said geodesic lens toward said detector end;

characterized in that said optical element comprises at least one non-geodesic or non spherical auxiliary depression in



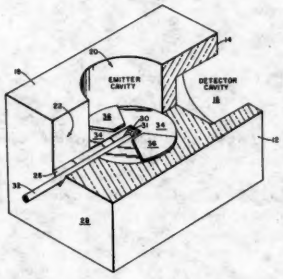
said substrate positioned between said at least one geodesic lens and said source end or said detector end within the focal path of said geodesic lens, said surface layer following the contour of said at least one auxiliary depression providing an increased path length for optical radiation traversing said surface layer, said auxilary depression having a depth sufficient to increase the length of the optical path of said surface layer, and thereby the focal length of said at least one geodesic lens, so that the focal line of said at least one geodesic lens is contiguous with the edge of said substrate at said source or said detector end without modification of the external dimensions of said substrate.

4,611,884

BI-DIRECTIONAL OPTICAL FIBER COUPLER

Harold Roberts, Westboro, Mass., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Nov. 24, 1982, Ser. No. 444,494
Int. Cl.⁴ G02B *6/26, 6/32*
U.S. Cl. 350—96.15 **18 Claims**



1. A bi-directional coupler for an optical fiber termination, comprising:

a monolithic coupler body of a light transmissive substance of substantially homogeneous index of refraction having an outer surface;

said monolithic coupler having a first integral cavity in communication with said outer surface for receiving a first semiconductor optical transducer along a first axis;

said monolithic coupler body having a second integral cavity in communication with said outer surface for receiving a second semiconductor optical transducer along a second axis;

said monolithic coupler body having an integral internal and elongated optical fiber receiving channel along a third axis which is at a substantially inclined angle to said second axis;

said optical fiber receiving channel terminating on its internal end in an optical surface integrally formed within said monolithic coupler body operative to provide a first light path wholly within said coupler body defined between the first axis of said first integral cavity and the third axis of said optical fiber receiving channel and operative to provide a second light path defined between the second axis of said second integral cavity and the third axis of said optical fiber receiving channel by reflection from said optical surface; and

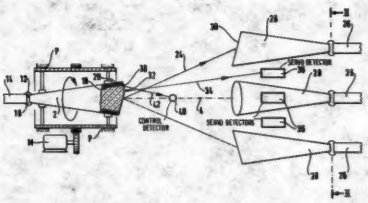
said second integral cavity terminating at said optical fiber receiving channel adjacent to said optical surface.

4,611,885

SWITCH FOR A LIGHT GUIDE CIRCUIT

Robert Boirat, Roinville, France, assignor to Compagnie Industrielle des Telecommincation Cit-Alcatel, Paris, France

Filed Dec. 29, 1983, Ser. No. 566,934
Claims priority, application France, Jan. 7, 1983, 83 00194
Int. Cl.⁴ G02B *6/00, 6/36, 6/38, 21/56*
U.S. Cl. 350—96.20 **8 Claims**



1. A light guide circuit switch for coupling a front end of a "common" guide at one end of said switch to a "particular" optical component selected from a set comprising a plurality of particular components at the other end of said switch, and in particular for directing light leaving said common guide towards said particular component, said switch comprising:

collimator means for transforming a highly divergent beam leaving the front end of the common guide into a substantially parallel external beam of increased cross section; and

controllable deflector means for deflecting said substantially parallel beam to direct it towards said selected particular component;

the improvement wherein said collimator means and said deflector means are constituted by a rear portion and a front portion respectively of a single transparent block disposed in front of said end of the common guide;

said single transparent block including a core of a frustoconical guide of circular cross section about an axis and extending from a small base thereof to a large base thereof situated in two planes perpendicular to said axis, said core defining said rear portion, said small base constituting a rear face for said block and facing said end of the common guide, and the axis being disposed in line with the axis of the common guide in such a manner as to couple the frustoconical guide thereto, the conical side surface of said core being covered with transparent cladding of lower refractive index than that of the transparent block in such a manner as to reflect light from a highly divergent beam leaving said fiber and to transform said beam into a nearly parallel beam passing through the large base of the truncated cone;

said front portion of said transparent block continuing from

said rear portion beyond said large base of the frustoconical guide core, said front portion forming a deflecting prism having a main rear face which includes at least a portion of said large base and having another face inclined relative to the first and constituting a main front face of said block;

said switch further including means for rotating said transparent block about the axis of said truncated cone in such a manner as to control said deflector means constituted by the front portion of said block without affecting the operation of said collimator means constituted by the rear portion of the block, such that the presence of said front portion of said transparent block causes collimated light to pass directly from said front portion inclined main front face of said block directly to said components in sequence solely upon rotation of said frustoconical guide about the axis.

4,611,886

INTEGRATED OPTICAL CIRCUIT PACKAGE

Terry W. Cline, Bethlehem, Pa.; Michael A. Karr, III, New Providence, and Frank H. Levinson, Whippany, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1983, Ser. No. 566,684

Int. Cl.[4] H01L *31/12;* **H04N** *9/27;* **H01J** *5/16;* **G02B** *6/36*

U.S. Cl. 350—96.20 **16 Claims**

1. Optical apparatus for use in a fiber optical system comprising:

a plurality of components formed in semiconductor chips bonded to a substrate;

a glass cover formed over the optical components and including a light transmission path formed therein, said cover also including means formed in one surface for aligning said cover in a mold; and

a molded material formed over said substrate and cover and including at one end of the light transmission path a connector portion having means for receiving an optical fiber so that the fiber is aligned with said light transmission path.

4,611,887

FIBER OPTIC CONNECTOR ASSEMBLY AND WALL OUTLET THEREOF

Douglas W. Glover; John C. Hoffer, both of Harrisburg; Erlon F. Johnson, Elizabethtown, and Ronald R. Schaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 469,344, Feb. 24, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,926

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **15 Claims**

1. A fiber optic connector assembly comprising:

at least one first fiber optic connector means each terminated onto a respective first fiber optic transmission means and a first fiber optic cable means and having a profiled front end means;

a like number of second fiber optic connector means each terminated onto respective second fiber optic transmission means and respective second fiber optic cable means and having a profiled front end means;

a like number of alignment ferrule means each having a profiled bore means extending therethrough, a rearward ferrule section having a rearward bore section to receive a said profiled front end means of a respective first fiber optic connector means, and a forward ferrule section having a forward bore section to receive a said profiled front end means of a respective second fiber optic connector means;

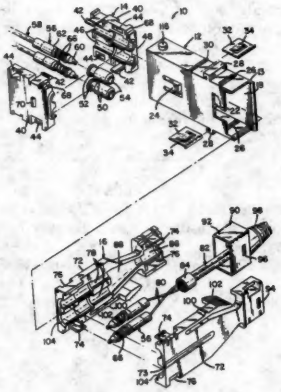
a receptacle connector means having a like number of first bore means each associated with a said first fiber optic connector means and a said alignment ferrule means, each said first bore means including a forward portion, and a ferrule mounting means at a front end thereof;

each said alignment ferrule means being movably mounted by said ferrule mounting means of a respective said first bore means of said receptacle connector means with said rearward ferrule section extending along said forward portion and said forward ferrule section extending forwardly from said receptacle connector means;

each said first fiber optic connector means being disposed in a respective said first bore means of said receptacle connector means with said profiled front end means extending into said rearward profiled bore section of a respective said alignment ferrule means;

a first spring means in each said first bore means engaging said first fiber optic connector means and urging said profiled front end means of said first fiber optic connector means into said rearward profiled bore section;

a plug connector means having a like number of second bore means each associated with a said second fiber optic connector means, each said second bore means including a forward portion;



each said second fiber optic connector means being disposed in a respective said second bore means of said plug connector means with said profiled front end means extending into said forward portion of said second bore means;

a second spring means in each said second bore means engaging said second fiber optic connector means;

a housing means having passageway means therethrough;

said receptacle connector means being securable in one end of said passageway of said housing means such that said forward ferrule second of each said one or more alignment ferrule means extends along said passageway means; and

said plug connector means being positionable in and latchably securable within the other end of said passageway of said housing means so that said forward ferrule section is received within said forward portion of a respective said second bore means and said forward bore section of said alignment ferrule receives a said profiled front end means of said second fiber optic connector means in spring-biasing engagement at least adjacent to said profiled front end means of a respective said first fiber optic connector means in said alignment ferrule means, whereby associated said first and second fiber optic connector means are placed under spring bias by said first and second spring

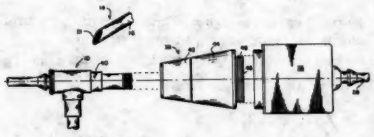
means and said first and second fiber optic transmission means therein are optically connected in axial alignment.

4,611,888

COUPLER FOR SURGICAL ENDOSCOPE AND VIDEO CAMERA

Melvin B. Prenovitz, and Koichiro Hori, both of Framingham, Mass., assignors to MP Video, Inc., Natick, Mass.

Filed Oct. 17, 1983, Ser. No. 542,742
Int. Cl.[4] G02B *6/40*
U.S. Cl. 350—96.22 **18 Claims**



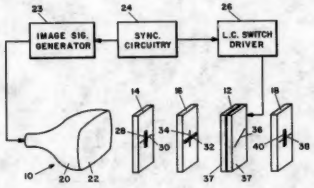
1. A coupled endoscope and video camera comprising:
an endoscope;
video camera means;
coupler means for connecting the endoscope to the camera, said coupler means further comprising:
a front coupler section and a rear coupler section, the proximal end of the endoscope being received in the front coupler section;
first seal means for effecting a liquid seal between the endoscope and the front section;
a rear coupler section having a rear end secured to said video camera means in liquid sealed relation;
said front and rear coupler sections being aligned along common axis, said front section being rotatable about said axis with respect to the rear section, whereby the front section and the endoscope can be rotatably oriented with respect to the video camera means; and
second liquid seal means between the front and rear sections.

4,611,889

FIELD SEQUENTIAL LIQUID CRYSTAL DISPLAY WITH ENHANCED BRIGHTNESS

Thomas S. Buzak, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 4, 1984, Ser. No. 596,799
Int. Cl.[4] G02F *1/133;* H04N *5/74*
U.S. Cl. 350—337 **18 Claims**



12. A method of producing a bright display comprising the steps of:
(a) producing a field-by-field sequence of images carried by light of plural wavelengths, the plural wavelengths including a nonzero component of a first primary color, a nonzero component of a second primary color, and a nonzero component of a third primary color;
(b) providing an alternating sequence of first and second control signals in synchronism with said sequence of images, with each control signal corresponding to a field of said sequence of images;
(c) selectively absorbing from said light in response to said first control signal, said component of said first primary color and substantially simultaneously transmitting a light output of said components of said second and third primary colors; and
(d) selectively absorbing in response to said second control signal said component of said second primary color and substantially simultaneously transmitting a light output of said components of said first and third primary colors.

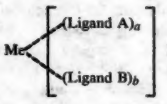
4,611,890

REDOX CHROMOPHORE COMPOUNDS AND ELECTRODES OF METAL CONTAINING SUBSTITUTED BIPYRIDINES

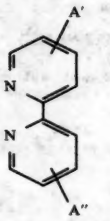
Cecil M. Elliott, and Jody G. Redepenning, both of Fort Collins, Colo., assignors to Research Corporation, New York, N.Y.

Filed Jan. 24, 1984, Ser. No. 573,886
Int. Cl.[4] C08F *126/06, 226/06;* G03C *1/03;* G02F *1/01*
U.S. Cl. 350—357 **38 Claims**

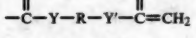
1. A polymer consisting of at least one compound having the structure



wherein Me is chromium or a Group VIII metal,
Ligand A is 4,4' or 5,5' substituted 2,2'bipyridyl group of the structure



wherein A' and A" are the same or different in each Ligand A and have the structure



wherein R is C_2 to C_{18} alkyl and R_i is H or CH_3, Y and Y' are the same or different and are —O— or

and R_{iv} is a C_1 to C_8 alkyl radical, and
Ligand B is an unsubstituted 2,2'-dipyridyl radical, a 2,2'-dipyridyl radical substituted with only one or more hydrocarbon radicals, or is a 4,4' or a 5,5' substituted 2,2' bipyridyl group of the structure shown above which is the same or different from that of Ligand A,
X is a compatible anion,
a and b are integers, a is 1, 2, or 3, b is 0, 1 or 2 and $a+b=1$, 2, or 3, and
n" is an integer which is 1, 2 or 3.

4,611,891

SUPPORT PANELS FOR PARABOLIC REFLECTORS

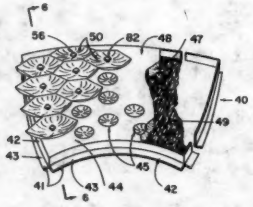
John A. Dane, 8823 Shellie La., Boise, Id. 83704

Division of Ser. No. 668,898, Nov. 7, 1984. This application Nov. 7, 1984, Ser. No. 668,900

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] G02B *7/18, 5/10*

U.S. Cl. 350—613 **8 Claims**



1. Support panels for a parabolic reflector of the type having a supporting framework and reflector bowls, each of said support panels having substantially parallel top and back surfaces, the top surface defining a plurality of recesses for receiving the reflector bowls, and each of said recesses provided with attachment means for holding each of the reflector bowls in a pre-selected position for focusing of solar rays, and each of said support panels having fastening means for attachment to said framework.

4,611,892

SYNTHETIC RESIN OPHTHALMIC LENS HAVING A SURFACE HARD COAT

Hiroshi Kawashima; Takao Mogami, and Satoshi Kubota, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,539

Claims priority, application Japan, Jun. 11, 1984, 59-119682; Feb. 5, 1985, 60-20269

Int. Cl.[4] G02C *7/02*

U.S. Cl. 351—159 **42 Claims**

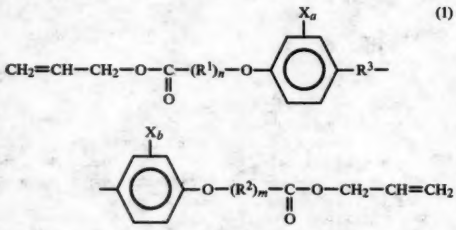
1. A method for preparing a synthetic resin ophthalmic lens having a surface hard coat deposited thereon comprising:

forming a synthetic resin lens base;

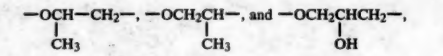
chemically treating the surface of the lens base with an aequeous solution of polyethyleneglycol and an alkali metal hydroxide; and

depositing a surface hard coat on the treated lens surface comprising:

at least one monomer of formula (1):



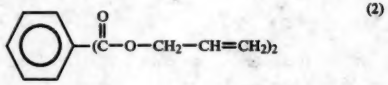
wherein R^1 and R^2 are one of $-OCH_2CH_2-$, $OCH_2CH_2CH_2-$,



R^3 is one of $-O-$, $-S-$, $-SO_2-$, $-CH_2-$, and

X is halogen except fluorine, a and b are integers from 1 to 4 and m and n are integers from 0 to 4; and

at least one bifunctional allyl phthalate of formula (2):



4,611,893

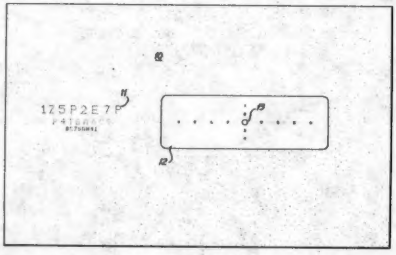
EYE CHART FOR SCREENING COMPUTER MONITOR OPERATORS

Melvin Schrier, Tenafly, N.J., assignor to Eyedex Associates, Fort Lee, N.J.

Filed Aug. 14, 1984, Ser. No. 641,036

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—239 **1 Claim**



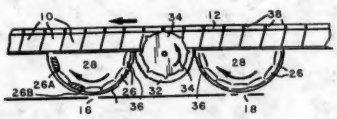
1. An eye testing chart employing means for screening for and quantifying the visual acuity of operators of computer monitors and screening for visual acuity, lateral phoria and vertical phoria, comprising in combination a first part comprising three rows of letters and numbers of predetermined size and spacing in dot matrix configuration suitable for use at a predetermined testing distance of about two feet wherein the top row of said rows of letters and numbers employs letters 6.0 mm. high, the center row of said row of letters and numbers employs letters 4.5 mm. high and the bottom row of said rows of letters and numbers employs letters 3.0 mm. high and a second part comprising an intersecting vertical and horizontal row of equal sized letters and numbers, 1 mm. in height, spaced 2 prism diopters apart.

4,611,894

DEVICE FOR DIRECT CINEMATOGRAPHIC VIEWING OF STEREOSCOPIC IMAGES ON FILM WITH A SOUND TRACK

Marcel Staar, Brussels, Belgium, assignor to Staar Development Co. S.A., Brussels, Belgium

Filed Feb. 6, 1985, Ser. No. 698,890
Claims priority, application Belgium, Feb. 6, 1984, 212,339
Int. Cl.[4] G03B *41/04*
U.S. Cl. 352—114 **3 Claims**



1. A device for cinematographic viewing of images on a strip of film comprising:

a housing having a viewing window to allow viewing of the images on the film strip through a field of view;

drive means in the housing adapted to receive and continuously move the film strip to pass the images on the film across the field of view of said viewing window; and

mobile refractive optical means in said housing movable by said drive means between the film strip and the viewing window across the field of view in synchronism with the passage of the film strip images and forming an optical image which is visible through the window as the film strip images enter and move across the field of view and which is fixed despite the continuous motion of the images on the film strip, said mobile refractive optical means movable between the film strip and the viewing window comprising:

magnifying lenses movable in succession across the field of view, the full passage of each magnifying lens corresponding to the full passage of an image on the film strip past the window,

a dish-shaped element supporting said lenses at its periphery obliquely to the plane of said dish-shaped element, said lenses and dish-shaped element being formed integrally as an injection-molded plastic part, and

means for rotatably supporting the dish-shaped element with the plane of the element inclined to a viewing axis intersecting one of said lenses and said window, each lens being movable across the field of view substantially transverse to said viewing axis as the dish-shaped element rotates.

4,611,895

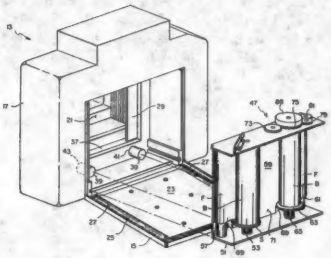
METERING ROLL FILM HOLDERS AND MULTI-FORMAT CAMERA

Neil G. Seely, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,932
Int. Cl.[4] G03B *17/02*
U.S. Cl. 354—159 **9 Claims**

1. A roll film holder adapted for use with a multi-format camera for taking different size pictures on separate rolls of similar length film, wherein said film holder is of the type having a frame, means on said frame for supporting a roll of unexposed film, and rotatable means on said frame for taking-up successive portions of film exposed in a focal plane in the camera, and wherein the improvement comprises:

metering means corresponding to a selected one of the picture sizes, said metering means being positioned on said frame for advancing roll film on the frame in predetermined length increments related to the selected size,



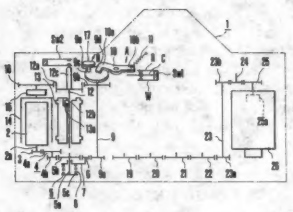
whereby a predetermined number of exposures may be obtained on the roll.

4,611,896

ELECTRICALLY-DRIVEN CAMERA

Tomonori Iwashita, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,456
Claims priority, application Japan, Feb. 28, 1983, 58-30697
Int. Cl.[4] G03B *1/00, 17/42*
U.S. Cl. 354—173.11 **2 Claims**



1. An electro-driven camera comprising:

(a) driving means for carrying out film winding through a film winding system mechanism, mechanical charging through a mechanical charging system mechanism and film rewinding through a film rewinding system mechanism;

(b) a control member arranged to move by said mechanical charging system mechanism when said driving means causes the film to be wound, said member taking a first state when the charging is completed, and a second state when an exposure starts;

(c) a first changeover switch operatively connected to said control member and responsive to setting of said control member in the first state for causing said driving means to operate in the film rewind mode, and to setting of said control member in the second state for causing said driving means to operate in the film wind mode;

(d) a system for transmitting the driving power of said driving means either to said film winding system mechanism and said mechanical charging system mechanism, or to said film rewinding system mechanism;

(e) a manually operable actuator member for setting said transmitting system in a state where the driving power of said driving means is not transmitted to said film winding system; and

(f) a second switch arranged to change its position when said manually operable actuator member is operated, whereby said driving means is caused to operate by changing the position of said switch.

4,611,897

SEGMENT INDICATION DEVICE

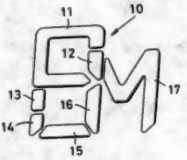
Masahara Hara, Tokyo, and Toshio Dobashi, Yokohama, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed May 29, 1985, Ser. No. 739,068

Claims priority, application Japan, Jun. 5, 1984, 59-83217[U]

Int. Cl.⁴ G03B *17/18*; G09G *3/04*

U.S. Cl. 354—475 **8 Claims**



5. A device for indicating characters, comprising:

first character indicating means including plural segments arranged along two vertically adjoining rectangles with a horizontal common side therebetween, said plural segments including a first pair of segments having an upper segment and a lower segment separated in the middle of the right-hand vertical side of the upper one of said rectangles, each segment of said first pair being so shaped as to at least partly lie along the right-hand vertical side of said upper rectangle, and a second pair of segments having an upper segment and a lower segment separated in the middle of the left-hand vertical side of the lower one of said rectangles, each segment of the second pair being so shaped as to at least partly lie along the left-hand vertical side of said lower rectangle; and

second character indicating means for indicating a character M, including at least one segment disposed along a left-hand vertical line of the character M which is common to the right-hand sides of said upper and lower rectangles.

4,611,898

VOLTAGE DETECTING DEVICE

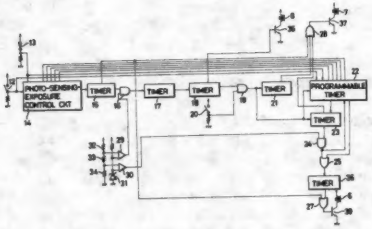
Shinichi Matsuyama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,125

Claims priority, application Japan, Feb. 13, 1984, 59-24683

Int. Cl.⁴ G03B *7/26*

U.S. Cl. 354—484 **22 Claims**



1. A voltage detecting device for a camera, comprising:

(a) shutter control means for controlling the start of the running of a follower screen of a shutter by control of the power supply to an electromagnetic member;

(b) a voltage detecting circuit for detecting the voltage level of a power source voltage, said circuit performing the detection with connection to an electric load different from said electromagnetic member; and

(c) operating means for intermittently detecting the voltage by means of said voltage detecting circuit during a period of time from the start of the running of a leader screen of the shutter until the start of the running of the follower screen.

4,611,899

DEVELOPING APPARATUS

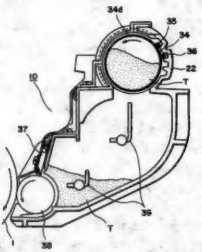
Toshirou Kasamura, Yokohama, and Nobukazu Sasaki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,499

Claims priority, application Japan, Jan. 8, 1983, 58-1562; Jan. 8, 1983, 58-1565; Jan. 8, 1983, 58-1568

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 DD **14 Claims**



1. A developing apparatus loadable with a selected one kind of various kinds of developer containers which contain developers of different colors, respectively, each developer container having a color-discriminating means representative of the color of the developer contained therein, said apparatus comprising:

a developer container receptacle, having a developer container receiving portion which is provided with a receiving opening, for storing the developer supplied from the developer container;

preventing means for preventing insertion of the container into said receptacle by abutment with the color-discriminating means of the container, said preventing means including a plurality of preventing portions which correspond to respective kinds of the developer containers and which are each structured and disposed for preventing insertion of said respective kind of developer container, and said preventing portions being selectively releasable; and

developer carrying means for carrying the developer from the developer receptacle toward a latent image bearing member to develop a latent image borne thereon.

4,611,900

APPARATUS FOR SENSING THE PRESENCE OF TONER PARTICLES

Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,033

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **6 Claims**

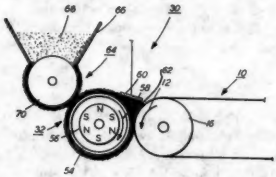
1. An apparatus for developing a latent image recorded on an image bearing member with toner particles, including:

means for transporting toner particles closely adjacent to the latent image;

means for supplying toner particles to said transporting means; and

means for sensing the thickness of the layer of toner particles formed on said transporting means, said sensing means comprising an electrically conducting plate adapted to be charged by toner particles in contact therewith and to be substantially uncharged when spaced from the toner parti-

cles, and means, in communication with said plate and said supplying means, for transmitting a signal to said supplying means de-energizing said supplying means in response

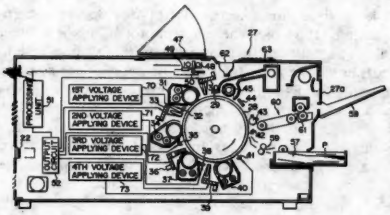


to said plate being charged and energizing said supplying means in response to said plate being uncharged so as to dispense toner particles to said transporting means when toner particles are spaced from said plate.

4,611,901
ELECTROPHOTOGRAPHIC METHOD AND APPARATUS

Mitsuaki Kohyama, Tokyo; Toshihiro Kasai, Yokohama; Haruhiko Ishida, Tokyo, and Shigenobu Osawa, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 5, 1984, Ser. No. 628,040
Claims priority, application Japan, Jul. 8, 1983, 58-124412
Int. Cl.[4] G03G *15/01, 13/01*
U.S. Cl. 355—4 **17 Claims**

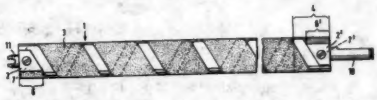


5. An electrophotographic apparatus comprising:
an image carrier which is moved along one direction and on which first and second latent images are formed;
first charging means for charging said image carrier;
first exposing means for exposing said image carrier charged by said first charging means and forming a first latent image corresponding to a first image on said image carrier;
first developing means for supplying a first developer to the first latent image and forming a first visible image on said image carrier;
second charging means for charging said image carrier having the first visible image thereon;
second exposing means for exposing said image carrier charged by said second charging means and forming a second latent image corresponding to a second image thereon;
second developing means for supplying a second developer to the second latent image and forming a second visible image on said image carrier;
transferring means for transferring the first and second visible images to a sheet; and
third charging means, arranged between said second developing means and said transferring means, for charging the first and second visible images such that a potential of the first visible image becomes substantially equal to that of the second visible image;
said second charging means including:
a corona charger for discharging corona and changing the potential on said image carrier by applying a voltage thereto,
limiting means, arranged between said corona charger and said image carrier, for limiting reaching of a predetermined charge from said corona charger on a surface of said image carrier in accordance with a surface potential at said image carrier.

4,611,902
ROLLER FOR PRESSING A SHEET AGAINST A HEATING SURFACE

Klaus-Peter Schön, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,325
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1983, 3339463
Int. Cl.[4] G03G *15/00;* **B21B** *31/08*
U.S. Cl. 355—3 FU **11 Claims**



1. A roller for pressing a sheet against a heating surface, comprising:
a generally cylindrical roller;
a tape wound spirally around said roller and substantially covering a longitudinally medial working surface of said roller, said tape being made of a clinging plastic material;
two clamping means, one disposed at each end of said roller, each for clamping a respective end of said tape to a respective end of said roller, wherein each of said clamping means comprises a quadrangular planar surface on said roller, a blind hole in said planar surface and clamping plate shaped to be congruent with said planar surface and having a hole thereon aligned with said blind hole; and
a clamping sleeve rotatably disposed around one end of the roller having a smaller diameter than said medial working surface.

9. A fixing subassembly for a copying machine comprising:
a heating surface;
a generally cylindrical roller having a longitudinal medial working surface thereof covered with a tape wound spirally around said roller, said tape being made of a clinging plastic material; and
a clamping sleeve having the same outer diameter as said roller, the wall of said clamping sleeve being penetrated by a tapped through-hole into which a set screw can be screwed, in order to lock the clamping sleeve in its position on the shaft of said roller.

4,611,903
IMAGE FORMING APPARATUS WITH REDUCED IMAGE FORMING TIME

Yukihiro Fukushi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 14, 1983, Ser. No. 551,695
Claims priority, application Japan, Nov. 17, 1982, 57-200415
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **3 Claims**

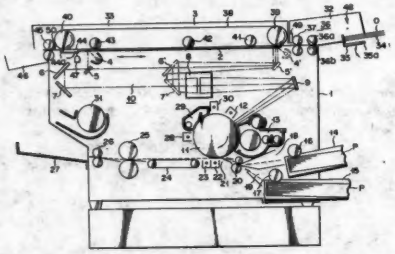
1. An image forming apparatus comprising:
an original document transfer section for transferring an original document to a predetermined position;
a movable scanning section for optically scanning the original document which is stationary at said predetermined position;
an image forming section for forming a visible image con-

taining optical information on said original document which is obtained by said movable scanning section; and

control means for controlling said sections; wherein

said control means includes at least scanning-ready-operation control means for starting a scanning-ready-operation required by said movable scanning section at a predetermined time, before said original document reaches said predetermined position;

said scanning-ready-operation control means including means for energizing an exposure light source of said movable scanning section and directing said exposure light source to the point where an effective scanning of said original document begins.



4,611,904

CONTROL SYSTEM FOR A COPYING MACHINE

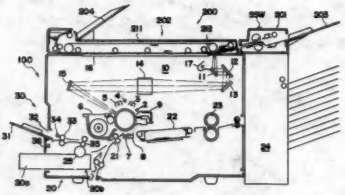
Kanji Wada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1984, Ser. No. 591,441

Claims priority, application Japan, Mar. 24, 1983, 58-49319

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **6 Claims**



1. In a copying machine having a main body that can be connected to a document feeder and a manual paper feeder for transporting manually-inserted copy paper into the copying machine, the copying machine having its operation controlled in an operative relationship with the document feeder so as to cause a start operation in which the document feeder transports a document to a predetermined position on a document support glass which is provided at the top of the copying machine and stops the document at the predetermined position and to thereafter cause a scanning means of the copying machine to scan the stationary document for a copying operation, and to cause an end of the operation wherein the document feeder discharges the document out of the document feeder after the completion of the copying operation for that document, a control system comprising:

a manual insertion-detecting means for detecting the insertion of copy paper into the manual paper feeder;

means for preliminarily setting the number of copies to be reproduced, said number setting means being capable of setting the number of copies when the manual paper feeder is in an operable condition;

means for detecting an agreement between a plural number of copies which are preset by the setting means and the actual number of copy papers detected by the manual insertion-detecting means; and

control means for controlling the document feeder to initiate the start operation upon detection of a first insertion of copy paper by the manual insertion-detecting means and to initiate the end of the operation upon detection of an agreement by the agreement-detecting means.

4,611,905

TONER DISPENSING CONTROL

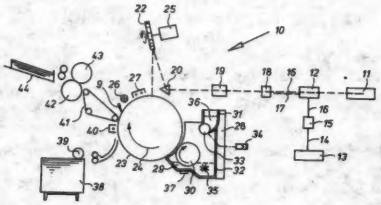
Lucien A. De Schamphelaere, Edegem; Freddy M. Librecht, Boechout, and Willy G. Verlinden, Edegem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Oct. 24, 1984, Ser. No. 664,421

Claims priority, application European Pat. Off., Nov. 1, 1983, 83201564

Int. Cl.⁴ G03G *15/08, 21/00*

U.S. Cl. 355—14 D **5 Claims**



4. A toner dispensing control device for a xerographic printer of the type wherein a photoconductor is electrostatically charged and image-wise exposed by line-wise exposing the photoconductor by means of appropriate activation of a plurality of linearly-spaced discrete sources of radiation in response to corresponding data bits, and developed by contact with a toner mixture attracted thereto from a mixture of magnetically-susceptible carrier particles and toner powder in a developing station provided with a toner dispenser, said control device comprising a magnetic density measuring circuit with means for measuring the magnetic density of carrier particles, means for producing a reference density, and means for comparing the measured density with the reference density and producing upon deviation of the actual from the reference magnetic density a toner dispensing signal, characterized in that the means for producing the reference density is adapted to produce a variable reference density, said means being controlled by signal control means that produces an output signal that is a function of the time of use of the toner mixture, said signal control means being responsive to time measuring means that measures the time of operation of the toner mixture.

4,611,906

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Hiroshi Iwaki, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 22, 1985, Ser. No. 693,628

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **20 Claims**

1. An electrophotographic copying apparatus which uses means for exposure-scanning an original to form an electrostatic latent image of said original of equal or reduced size on an electrified photosensitive member follow-up-moving in the exposure-scanning direction, said electro-static latent image being developed with toner, so that an image of said toner is transferred to copying paper, characterized by providing;

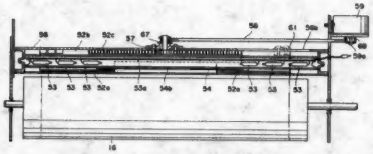
light sources disposed perpendicularly to the moving direction of said photosensitive member to irradiate the side edge portions thereof perpendicular to the moving direc-

tion of the same, thereby erasing unnecessary charge at said side edge portions, respectively;

a shading member movable perpendicularly to the moving direction of said photosensitive member, thereby changing irradiation areas of said light sources;

drive means for driving said shading member;

reduction rate detection means for detecting a reduction rate;



home position detection means for detecting the positioning of said shading member in a home position which is the basic position for controlling thereof; and

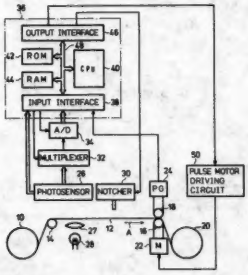
control means responsive to output signals from both said reduction rate detection means and said home position detection means, for controlling said drive means for first positioning said shading member at the home position whenever the reduction rate is changed, and thereafter at a predetermined position corresponding to the new reduction rate.

4,611,907

METHOD OF JUDGING FILM FRAME POSITION

Kenichi Inatsuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 4, 1985, Ser. No. 741,328
Claims priority, application Japan, Jun. 5, 1984, 59-115253
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—41 **20 Claims**



1. A method of judging a film frame position on a film, comprising of steps of:

(a) detecting film densities at plural locations across the width of the film at positions along the film length by a plurality of sensors disposed such as to be orthogonal to the direction in which a film is conveyed; and

(b) producing binary signals corresponding to the film densities at each of said plural locations, said binary signals assuming either a first binary level in response to a light location or a second binary level in response to a dark location;

(c) at each of said positions determining the logical sum (OR) of the binary signals which correspond to the densities at the plural locations of the position;

(d) at each of said positions determining the logical product (AND) of the binary signals which correspond to the densities at the plural locations of the position;

(e) determining the positions at which said logical sum changes value and said logical product changes value;

(f) determining the distance between a position at which the logical sum changes value and a position at which the logical product changes value;

(g) declaring a frame edge when said distance is within a predetermined value;

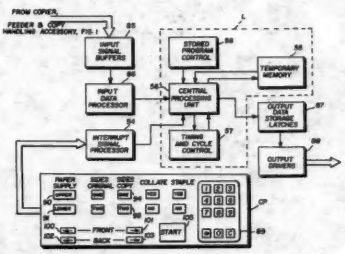
whereby it is possible to judge a frame position by detecting only one of the frame edges and it is possible for a frame position to be judged with high accuracy.

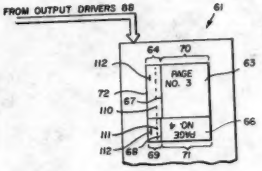
4,611,908

APPARATUS AND METHOD FOR FORMING REPRODUCTIONS WITH DESIRED MARGIN AREAS

Donald C. Buch, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,112
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—55 **15 Claims**





1. In combination with an apparatus for reproducing documents having image information onto an intermediate member and means for transferring the image information from the intermediate member onto copy sheet reproductions, the reproductions of the documents each having an image area and a margin area; memory means for storing information inputted therein relative to desired adjustment of margin size on the copy sheet reproductions; control means responsive to said memory means for adjusting said apparatus to produce reproductions of a document having desired margin sizes for facilitating reading of the reproductions when they are bound or stapled into copy sets; display means; means for illustrating on said display means indicia illustrating thereon a delineation between an image area and a margin area;

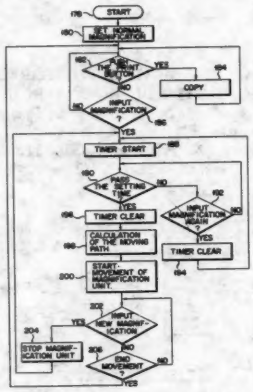
adjusting means for providing signals for adjusting said display means to visually change the delineation between said image area and said margin area in response to said information input into said memory means; and the improvement which comprises:

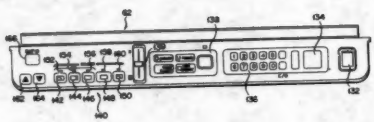
wherein the means for illustrating indicates a portion of said margin area on a copy sheet that will be hidden when the copy sheets are bound along said margin area.

4,611,909
MAGNIFICATION SELECTABLE IMAGE FORMING APPARATUS

Masahiko Ogura, Fujisawa, and Hideshi Oushiden, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1984, Ser. No. 625,794
Claims priority, application Japan, Jul. 6, 1983, 58-123012
Int. Cl.[4] G03B *27/34, 27/40*
U.S. Cl. 355—56 10 Claims





1. An image forming apparatus which sets the magnification of an image to be formed, comprising:

input means for inputting magnifications of an image to be formed;

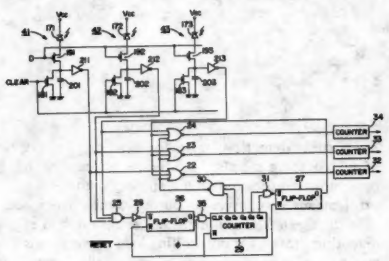
magnification setting means for setting a selected magnification input by said input means so as to provide an image at the magnification; and

control means coupled to said input means for controlling said magnification setting means in such a manner that said magnification setting means sets the selected magnification input by said input means, said control means including: (a) counting means for counting a time interval, initiated in response to input of said selected magnification by said input means, and ended by any one of reaching a predetermined time interval and input of another magnification by said input means; and (b) comparator means for comparing said counted time interval to said predetermined time interval and for setting said another magnification only when said counted time interval is shorter than said predetermined time interval.

4,611,910
RANGE FINDER

Kiziro Suzuki, Hamura; Takashi Tsutsumi, Tokyo; Shotaro Yokoyama, and Takashi Nishibe, both of Yokosuka, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd.; Fuji Electric Company Ltd. and Fuji Electric Corporate Research and Development Ltd., all of, Japan

Filed May 4, 1984, Ser. No. 607,208
Claims priority, application Japan, May 8, 1983, 58-80416
Int. Cl.[4] G01C *3/18;* G03B *3/00*
U.S. Cl. 356—1 3 Claims

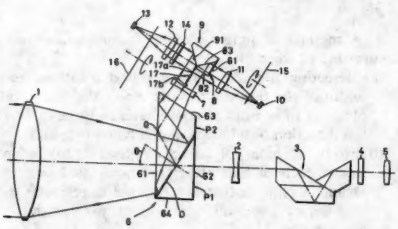


1. In a range finder including a first and a second optical means for receiving light reflected by an object through different light paths so as to form images on a predetermined focal plane, a first and a second light receiving element trains in which a predetermined number of light receiving elements are arranged in correspondence to the images on said focal plane, and a first and a second quantizing means for quantizing the photocurrent in said respective light receiving elements in said first and second light receiving element trains and providing outputs, the corelation therebetween being used for determining the distance to be measured, the improvement characterized in that said first and second quantizing means quantize the photocurrent in said light receiving elements in said first and second light receiving element trains with reference to the maximum photocurrent in said light receiving elements in said first and second light receiving element trains.

4,611,911
ELECTRO-OPTICAL DISTANCE MEASURING DEVICE

Yuji Kadomatsu, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,580
Claims priority, application Japan, Dec. 26, 1983, 58-249096; Dec. 26, 1983, 58-249097
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 7 Claims



1. Apparatus for distance measurement comprising:

(a) a collimating optical system containing objective lens means, focusing lens means and eye-piece means arranged in the named order;

(b) optical path dividing means disposed between said objective lens means and said focusing lens means, said optical path dividing means containing a reflecting surface disposed inclined relative to the optical axis of said objective lens means and formed to partly transmit light;

(c) auxiliary lens means disposed in the optical path divided from the optical path of said collimating optical system by said reflecting surface, said auxiliary lens means cooperating with said objective lens means to form an afocal system;

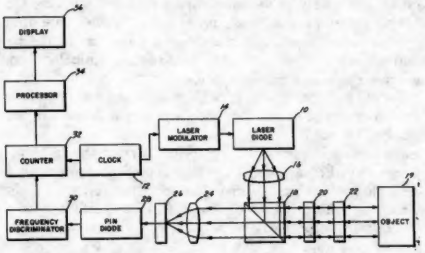
(d) transmission means comprising a light source, means for collimating the light from said light source and first optical means for making the collimated light enter a part of the area of said auxiliary lens means from the direction parallel to the optical axis of said auxiliary lens means, through which transmission means the light from said light source is emitted from said objective lens means; and

(e) reception means comprising second optical means for sampling the light passing through another part of the area of said auxiliary lens means after entering said objective lens means, photo receptor means having a light-receiving surface for forming an electric output corresponding to the quantity of the light received by it and means for focusing the light coming from said second optical means on said light-receiving surface of said photo receptor means.

4,611,912
METHOD AND APPARATUS FOR OPTICALLY MEASURING DISTANCE AND VELOCITY

Robert A. Falk, Louisville, and Gary L. Phillis, Boulder, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 4, 1983, Ser. No. 481,988
Int. Cl.⁴ G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **9 Claims**



1. In an apparatus for optically making measurements relating to an object, an assembly comprising:

an optical radiation source that emits a first modulated optical radiation signal;

first means for sweeping the frequency of modulation of said first optical radiation signal across a predetermined frequency range over a predetermined time period;

optical directing means for directing a portion of said first optical radiation signal towards the object;

second means for employing a portion of said first optical radiation signal to obtain a second optical radiation signal;

optical receiving means for receiving at least a portion of said second optical radiation signal and a portion of said first optical radiation signal that reflects off of the object;

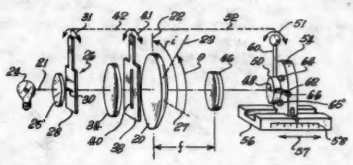
optical mixing means responsive to said optical receiving means for mixing said received portions of said first and second optical radiation signals to produce an electrical output signal; and

third means that employs said electrical output signal to determine a frequency difference that arises when said received portion of said first optical radiation signal travels to and from said object, and that employs said frequency difference, said predetermined frequency range and said predetermined time period to calculate the distance of the object relative to the apparatus.

4,611,913
METHOD AND APPARATUS FOR ANALYZING OPHTHALMIC ELEMENTS AND THE LIKE

Paul S. Sugino, 4808 Cameo Dr., Santa Maria, Calif. 93455

Filed Apr. 19, 1982, Ser. No. 369,739
Int. Cl.⁴ G01B *9/00*
U.S. Cl. 356—127 **16 Claims**



1. The method of analyzing an effectively thin lens means which may be astigmatic to determine the optical power thereof in a selected meridian which may be obliquely related to the cylindrical axis of the lens means, comprising

positioning the lens means as part of an optical system that is adapted for imaging a target and that includes means for varying the focal condition,

said optical system being such that the lateral magnification of the target image varies with the focal condition and has, for correct focus, a predetermined critical value independent of the power of the lens means,

providing in said optical system a target having a target pattern adapted for determining the lateral magnification of the target image in said selected meridian,

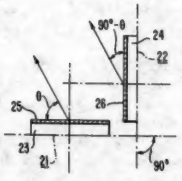
varying the focal condition of the optical system and determining the focal condition for which the image magnification in the selected meridian has said critical value,

and employing the so determined focal condition as a measure of the power of the lens means in said selected meridian.

4,611,914
SUNBEAM INCIDENT ANGLE DETECTING DEVICE

Mitsuo Homma, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 3, 1983, Ser. No. 548,439
Claims priority, application Japan, Nov. 4, 1982, 57-193784
Int. Cl.⁴ G01B *11/26*; G01C *1/00*; G01J *1/20*
U.S. Cl. 356—141 **5 Claims**



1. A device for detecting a sunbeam incident angle with respect to a surface comprising:

first and second solar cells attached to said surface and arranged in a relation perpendicular to each other;

a first resistor connected across the output of said first solar cell;

a second resistor connected across the output of said second

solar cell, said first resistor and said second resistor each having a low resistance value;

means for detecting a ratio of short-circuit currents of said first and second solar cells flowing in said first resistor and said second resistor, respectively; and

means for calculating the sunbeam incident angle θ in terms of the tan θ from the ratio of short-circuit currents.

4,611,915

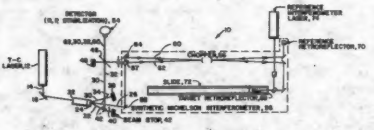
ABSOLUTE DISTANCE SENSOR

Calvin W. Gillard; Neal E. Buholz, both of Palo Alto, and William M. Wells, III, Stanford, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 7, 1983, Ser. No. 501,945

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 1 Claim



1. An improved absolute distance sensor comprising:

a two-color laser, said two-color laser being a laser operating simultaneously on a R-line and a P-line being a two-color pair, said laser selectively switching between a plurality of two-color pairs, each of said two-color pairs having at least one different line therein, said two-color laser outputting a carrier beam having said two-color pair therein;

a computer, said computer determining said two-color pair to be output by said two-color laser;

oscillator means for providing drive frequencies in response to an output from said computer;

a controller, said controller connected to said two-color laser, said controller causing said two-color laser to switch through a selected group of said two-color pairs;

a multi-frequency Bragg cell, said Bragg cell shifting the frequency of said carrier beam having said two-color pair therein, said Bragg cell outputting a plurality of beams, said beams having an R beam and a P beam colinear therein and being spectrally separated, one of said plurality of beams being an interferometer beam having a R beam and a P beam therein, another of said plurality of beams being a local oscillator beam having an R beam and a P beam therein, and another of said plurality of beams being a laser control beam for determining laser stabilization between R and P beam power, said local oscillator beam and said interferometer beam having frequencies on opposite sides of a frequency of said carrier beam, said Bragg cell being excited by a plurality of said drive frequencies from said oscillator means connected to said computer;

means for stabilizing said two-color laser, said means for stabilizing receiving said laser control beam and outputting control signals to said computer;

means for aligning and intensity adjusting said local oscillator beams and said interferometer beam;

a synthetic Michelson interferometer for receiving said interferometer beam, said interferometer outputting alternatively a target return beam and a reference return beam;

means for combining said return beams and said local oscillator beam;

a detector responsive to changes in fringes of said return beams and said local oscillator beam; and

means for determining phase between said local oscillator beams and said target return beams, said means for determining phase connected to receive signals from said detector and outputting a phase to said computer.

4,611,916

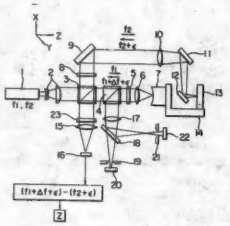
OPTICAL MEASURING APPARATUS

Keiichi Yoshizumi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1984, Ser. No. 609,196

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 3 Claims



1. An optical measuring apparatus comprising:

a light source for highly precisely, stably generating measuring light of a frequency f_1 and reference light of a frequency f_2;

first optical means for focusing the measuring light on a surface of an object fixed on a carrier;

moving means for moving said carrier along a direction perpendicular to an optical path of the measuring light;

controlling means for controlling to keep a constant distance between an objective lens of said first optical means and the surface of the object;

second optical means for focusing the reference light on a mirror arranged on said carrier to be substantially perpendicular to the optical path of the measuring light;

third optical means for allowing on a first photodetector interference between the measuring light reflected by the surface of the object and transmitted through said first optical means again and the reference light reflected by said mirror and transmitted by said second optical means, whereby a beat frequency caused by the interference of reflected light components of the measuring and reference light is detected to measure the shape of the surface of the object;

a second photodetector for receiving part of the light reflected by the surface of the object and for detecting a deviation in position or distribution of the reflected light which is caused by an inclination of the surface of the object with respect to a plane perpendicular to the optical axis of said objective lens; and

driving means, responsive to an error signal obtained from said second photodetector, for moving one of said objective lens and said light source along a direction perpendicular to the optical axis, thereby substantially aligning the optical path of the light reflected by the surface of the object with that of the light incident thereon.

4,611,917

OPTICAL SYSTEM FOR DETERMINING AN OBJECT'S POSITION

Jean Robieux, Chatenay Malabry; Jean Cornillault, Nozay, and Antoine Bettinger, Janville sur Juine, all of France, assignors to Compagnie Generale d'Electricite, France

Filed Jul. 9, 1984, Ser. No. 629,020

Claims priority, application France, Jul. 8, 1983, 83 11423

Int. Cl.[4] G01B *11/14, 11/24*

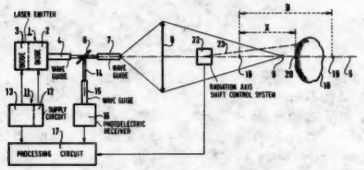
U.S. Cl. 356—37 S 7 Claims

1. In an optical system for determining an object's position, comprising:

a laser frequency generator,

a convergent optical emission system arranged at the generator output to direct the laser radiation towards the object along at least one axis,

a photoelectric receiver sensitive to the laser radiation,
an optical reception system directing a part of the laser radiation diffused by the object towards said receiver,
and a processing circuit connected to said receiver and receiving said receiver electrical output,
the improvement wherein;
the generator comprises; a laser transmitter laser having a controllable radiation frequency,
and said system comprises; means for varying the laser transmitter frequency in relation to time according to a predetermined law; said convergent optical emission system is chromatic and includes means for focusing the laser radiation in a concentration point situated on said axis 5; said law being such as to move the concentration point along



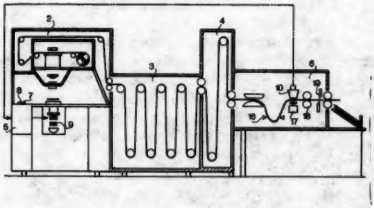
said axis towards the object in relation to time, the object's surface sending back a light signal to said optical reception system when the concentration point impinges on said surface; the receiver issuing an electrical signal when it receives a light signal;
said optical system further comprising means connecting the processing circuit to said means for varying the laser frequency including a clock to measure the time interval between the beginning of the laser transmitter frequency variation and the instant when the receiver issues the electric signal, such that said time interval is representative of the position of said laser radiation concentration point when the object's surface intercepts said concentration point.

4,611,918

METHOD OF DETERMINING THE OPTIMUM EXPOSURE CONDITIONS FOR A COLOR PRINTER

Shigeki Nishida, Kainan, and Hiroo Ikeura, Wakayama, both of Japan, assignors to Noritsu Kenkya Center Co., Ltd., Japan

Filed Mar. 16, 1984, Ser. No. 590,142
Claims priority, application Japan, Mar. 24, 1983, 58-47978; Jun. 20, 1983, 58-109309
Int. Cl.[4] G01J *3/51*; G03B *27/80*
U.S. Cl. 356—404 **1 Claim**



1. A method of determining the optimum exposure time condition for a photographic color printer including four lines of correction keys comprising density keys, yellow keys, magenta keys and cyan keys which have a series of keys differing by one unit corresponding to different exposure time, essentially comprising the following steps;
preparing 8 test prints under different exposure time condition using a standard negative film by way of exposing, developing and drying of printing paper, said exposure time condition being such that one of correction keys selected from the four lines is +1 correction key or −1 correction key and remaining keys are normal keys,
measuring optical density for each of color components Y.M.C. on the test prints,
comparing their optical density with that of corresponding color component on a standard print to obtain

$$Y_{+1D},\ Y_{-1D},\ Y_{+1Y},\ Y_{-1Y},\ Y_{+1M},\ Y_{-1M},\ Y_{+1C},\ Y_{-1C},\ M_{+1D},\ M_{-1D},\ M_{+1Y},\ M_{-1Y},\ M_{+1M},\ M_{-1M},\ M_{+1C},\ M_{-1C},\ C_{+1D},\ C_{-1D},\ C_{+1Y},\ C_{-1Y},\ C_{+1M},\ C_{-1M},\ C_{+1C},\ C_{-1C},$$

determining corrective values X_D, X_Y, X_M, X_C required for correcting density differences between test print prepared by using all normal keys with respect to density key, yellow key, magenta key and cyan key and standard print by satisfying the following equations:

$$0 = \tfrac{1}{8}(Y_{+1D} - Y_{-1D})X_D + \tfrac{1}{8}(Y_{+1Y} - Y_{-1Y})X_Y + \tfrac{1}{8}(Y_{+1M} - Y_{-1M})X_M + \tfrac{1}{8}(Y_{+1C} - Y_{-1C})X_C + \tfrac{1}{8}(Y_{+1D} + Y_{-1D} + Y_{+1Y} + Y_{-1Y} + Y_{+1M} + Y_{-1M} + Y_{+1C} + Y_{-1C})$$

$$0 = \tfrac{1}{8}(M_{+1D} - M_{-1D})X_D + \tfrac{1}{8}(M_{+1Y} - M_{-1Y})X_Y + \tfrac{1}{8}(M_{+1M} - M_{-1M})X_M + \tfrac{1}{8}(M_{+1C} - M_{-1C})X_C + \tfrac{1}{8}(M_{+1D} + M_{-1D} + M_{+1Y} + M_{-1Y} + M_{+1M} + M_{-1M} + M_{+1C} + M_{-1C})$$

$$0 = \tfrac{1}{8}(C_{+1C} - C_{-1C})X_D + \tfrac{1}{8}(C_{+1Y} - C_{-1Y})X_Y + \tfrac{1}{8}(C_{+1M} - C_{-1M})X_M + \tfrac{1}{8}(C_{+1C} - C_{-1C})X_C + \tfrac{1}{8}(C_{+1D} + C_{-1D}) + C_{+1Y} + C_{-1Y} + C_{+1M} + C_{-1M} + C_{+1C} + C_{-1C})$$

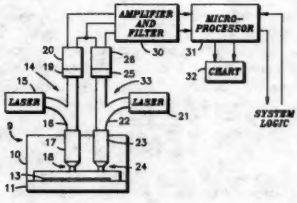
$$X_Y + X_M + X_C = 0.$$

4,611,919

PROCESS MONITOR AND METHOD THEREOF

Edward A. Brooks, Jr., and Roger M. Bithell, both of Novato, Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Mar. 9, 1984, Ser. No. 588,028
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—357 **10 Claims**



8. A method for monitoring the change in thickness of an article, subjected to a process which acts upon at least one surface of said article, comprising the steps of:
illuminating a portion of said surface with coherent radiation;
detecting radiation reflected from said surface and producing an analog signal proportional thereto;
wherein said illuminating detecting steps are carried out at

more than one location on said surface to produce several analog signals; and

identifying points in said analog signals indicative of predetermined changes in thickness.

4,611,920

DEVICE FOR MEASURING EXTREMELY DIMINISHED INTENSITY OF LIGHT

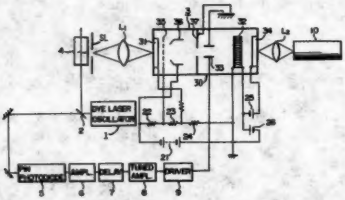
Yutaka Tsuchiya, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 14, 1983, Ser. No. 532,055

Claims priority, application Japan, Sep. 28, 1982, 57-169381

Int. Cl.⁴ G01N *21/64*

U.S. Cl. 356—318 **2 Claims**



1. A device for measuring an extremely diminished intensity of light comprising:

a stimulus signal source which stimulates an object being measured so as to repetitively emit light pulses at predetermined timing intervals;

a streaking tube including

a photoelectric layer for converting said repetitive light pulses to corresponding electric signals;

a deflection electrode for generating a deflection electric field for deflecting a single photoelectron;

a micro-channel-plate consisting of curved micro-channels for multiplying said single photoelectron so as to generate a plurality of electrons at the output thereof, the distribution of said electrons having a narrow half-value centered at a predetermined frequency of occurrence;

a phosphor layer stimulated by electrons at the output of said micro-channel-plate, a spot having approximately the same brightness for each of said single photoelectrons being formed on the surface of said phosphor layer whereby the brightness of said spot corresponds to the number of multiplied electrons;

a deflection circuit for applying, to said deflection electrode, a sweeping voltage synchronized with the stimulating signal issued from said stimulus signal source; and

detecting means for detecting the brightness of said spot on the phosphor layer of said streaking tube by means of photoelectric conversion, said detecting means being a television imaging device wherein the horizontal trace thereof extends orthogonally to the direction of deflection of said streaking tube.

4,611,921

DEBRIDGING APPARATUS

Jitendra A. Patel, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,164

Int. Cl.⁴ B01F *7/08, 15/02*

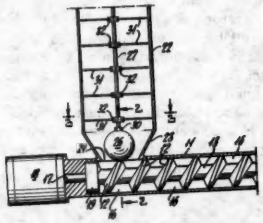
U.S. Cl. 366—156 **9 Claims**

1. Debridging appatatus for use with a rotatable feed screw having threads positioned to receive finely divided solids from a hopper, comprising

free standing agitating means adapted for removable location in said hopper,

said agitating means comprising an elongated member adapted for being centrally located in an upstanding position in said hopper,

a plurality of transverse elements extending from said elongated member and adapted for reaching close to the walls of said hopper, and



an integrally attached base on said elongated member,

said base being adapted for resting on the threads of said rotatable screw feed whereby said agitating means moves up and down over succeeding threads moving relatively under said hopper.

4,611,922

APPARATUS FOR TREATING MATERIALS WHICH ARE CAPABLE OF FLOW

Willi Eirich, Bahnhofstr. 19, 6969 Hardheim, Fed. Rep. of Germany, assignor to H. Eirich; P. Eirich and W. Eirich, all of Hardheim, Fed. Rep. of Germany

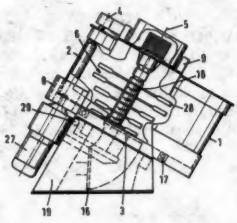
PCT No. PCT/DE84/00085, § 371 Date Sep. 19, 1984, § 102(e) Date Sep. 19, 1984, PCT Pub. No. WO84/04055, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 9, 1984, Ser. No. 668,729

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312869

Int. Cl.⁴ B01F *9/00*

U.S. Cl. 366—221 **7 Claims**



1. Apparatus for treating flowable materials comprising a substantially cylindrically shaped container divided into two uppermost quadrants I and IV and two lowermost quadrants II and III, said quadrants being arranged in succession about a central axis, said container having a bottom and a wall extending upwardly therefrom, said container being mounted for rotation about said central axis and said axis being inclined with respect to the vertical, thereby forming downstream flow portions and upstream flow portions of said rotating container, said downstream flow beginning at an apex of said container formed by said incline, said container also having a wall and/or bottom scraper plate which is arranged substantially stationarily with respect to the wall of the container, a discharge opening disposed in the bottom of the container and a rotating tool which engages into the material, characterized in that the container is driven at a sub-centrifugal speed of rotation, the rotating tool being arranged exclusively in the downstream portion in quadrant I and/or II, the space in the upstream portion in quadrants III and IV including no further material

mixing apparatus and said scraper plate being disposed in the vicinity of the apex of the container.

4,611,923

ELECTRONIC TIMEPIECE WITH A DEPTH GAUGE

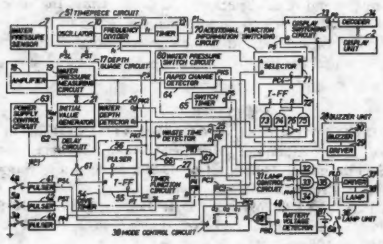
Hisashi Kawahara, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

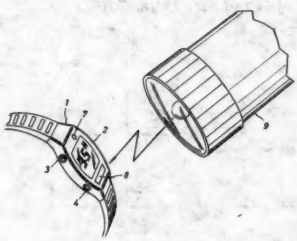
Filed Nov. 27, 1985, Ser. No. 802,645

Claims priority, application Japan, Nov. 30, 1984, 59-252870; Nov. 30, 1984, 59-252871; Nov. 30, 1984, 59-252872; Dec. 4, 1984, 59-256223; Feb. 5, 1985, 60-20533

Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—10 **9 Claims**





1. An electronic timepiece with a depth gauge, having a power supply battery, a timepiece circuit, a display unit, a water pressure sensor, a depth gauge circuit for receiving a sensor signal from said water pressure sensor and generating a water depth information signal, a mode control circuit for switching a timepiece mode and a depth gauge mode, and a display switching circuit for selectively displaying a time information signal from said timepiece circuit or the water depth information signal from said depth gauge circuit in response to a control signal from said mode control circuit, characterized by a battery voltage detector for detecting a voltage drop of said battery, and the arrangement such that said mode control circuit is rendered inoperative in response to a detection signal from said battery voltage detector, and the depth gauge mode is inhibited when the battery voltge drops below a predetermined voltage.

4,611,924

CONTAINER INCORPORATING AN ALARM

Howard R. Stasin, No 1 Heilbron Flats, Sophia St., Oranjezicht, Cape Province, South Africa

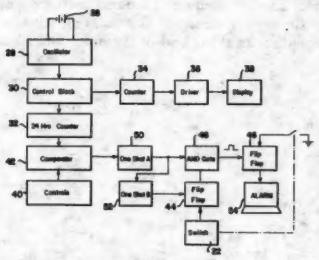
Filed Jun. 7, 1984, Ser. No. 618,202

Claims priority, application South Africa, Jun. 8, 1983, 83/4191

Int. Cl.[4] G04B *47/00*; G04F *8/00*

U.S. Cl. 368—10 **3 Claims**

1. A container comprising a first part and a second part, the parts being movable with respect to one another between a position in which the container is closed and a position in which the container is open, switch means which are actuated by relative movement between the container parts when the container is opened, and an alarm for warning that the container has not been opened during a predetermined interval of



time, said alarm being connected to said switch means in such manner that the state of the alarm is altered when the container is opened during said predetermined interval of time so that said alarm is not actuated at the end of said predetermined interval of time.

4,611,925

TIMEPIECE WITH CALENDAR

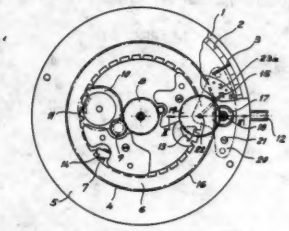
Cyril Vuilleumier, and Bruno Erni, both of Bienne, Switzerland, assignors to Omega SA, Switzerland

Filed May 3, 1985, Ser. No. 730,128

Claims priority, application Switzerland, May 18, 1984, 2447/84

Int. Cl.[4] G04B *19/24*

U.S. Cl. 368—28 **8 Claims**



1. In a calendar timepiece having a calendar ring arranged to be stepwise driven once per day by a mechanism controlled by the timepiece motor and a hand for displaying the date, the improvement comprising means driven by said calendar ring for driving said hand.

4,611,926

TIME INTERVAL MEASURING INSTRUMENT

Mishio Hayashi, Saitama, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,853

Claims priority, application Japan, Oct. 7, 1983, 58-188778

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—120 **18 Claims**

1. A time interval measuring instrument comprising:

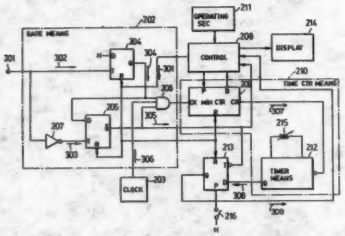
a clock pulse source for generating clock pulses;

gate means supplied with the clock pulses from the clock pulse source and an input time signal, for outputting the clock pulses for a period of time corresponding to the duration of the input time signal;

time counter means supplied with the clock pulses from the

gate means, for generating a validity signal for a period corresponding to the difference between predetermined minimum and maximum values of time intervals of said input time signal to be measured;

decision means supplied with the validity signal from the time counter means and a signal corresponding to the end of the input time signal, for deciding whether the validity signal exists at the end of the input time signal;



measuring means for measuring the duration of the input time signal; and

control means for inputting thereinto the measured value from the measuring means, as valid data, when the validity signal is decided to exist at the end of the input time signal according to the result decision by the decision means.

4,611,927

ELECTRONIC TIMEPIECE HAVING MEANS FOR CORRECTING THE SECONDS INDICATION

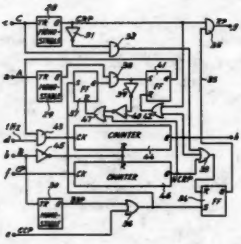
Pierre-André Meister, Bienne, and Daniel Koch, Crémines, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Granges, Switzerland

Filed Aug. 1, 1985, Ser. No. 761,460

Claims priority, application Switzerland, Aug. 14, 1984, 3895/84

Int. Cl.[4] G04C *9/00*

U.S. Cl. 368—188 **13 Claims**



1. An electronic timepiece comprising:

a time base for generating a standard frequency signal;

a frequency dividing circuit coupled to said time base for generating time pulses;

a display unit able to indicate at least the minutes and the seconds in response to said time pulses;

a manual control member; and

a correction circuit which, when the control member is actuated in a first way, causes the timepiece to switch from a normal operation mode to a correction mode in which the minutes indication may be corrected by actuating the control member in a second way, wherein said correction circuit comprises a control circuit for resetting the seconds to zero which (a), in the case where the control member has only been actuated in the first way and in the case where the control member has successively been actuated in both the first and in second ways, enables the timepiece to be put in a transitory zero-seconds resetting mode for a set maximum period from the moment the timepiece ceases to be in the correction mode, and which (b) is arranged (i) instantaneously to act on the display unit so that the seconds indication is reset to zero and to cause the timepiece to switch back to the normal operation mode, when the control member is actuated in a third way before the end of said period, and (ii) to cause the timepiece to switch back to said normal operation mode only at the end of said period if the control member has not been actuated before.

4,611,928

METHOD FOR MEASURING COAGULATION OF MILK

Tomoshige Hori, Kitamoto; Masatoshi Kako, Sayama, and Hayashi Hiromichi, Tokyo, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Japan

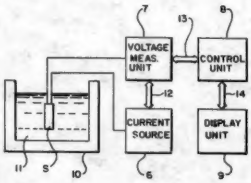
PCT No. PCT/JP84/00269, § 371 Date Jan. 23, 1985, § 102(e) Date Jan. 23, 1985, PCT Pub. No. WO84/04813, PCT Pub. Date Dec. 6, 1984

PCT Filed May 25, 1984, Ser. No. 693,998

Claims priority, application Japan, May 25, 1983, 58-92079

Int. Cl.[4] G01N *25/18;* G01R *27/07*

U.S. Cl. 374—21 **3 Claims**



1. A measurement method for determining the state of coagulation of milk in production processes of milk products such as cheese and yogurt, which method comprises placing, as a measuring sensor, an assembled probe unit for insertion in the milk consisting of a metal wire having a preselected length, current-feeding terminals and voltage-measuring terminals connected to preselected spaced locations on said metal wire, selectively supplying an electric current either intermittently or continuously through the metal wire and, while the electric current is being supplied therethrough, measuring and recording the degree of temperature increase of the metal wire through the measuring sensor over a given period of time thereby determining the state of coagulation of the milk in a continuous, quantitative and non-destructive manner.

4,611,929

SATELLITE METHOD FOR MEASURING SEA SURFACE TEMPERATURE

Ronald J. Holyer, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 477,199

Int. Cl.[4] G01J *5/00*

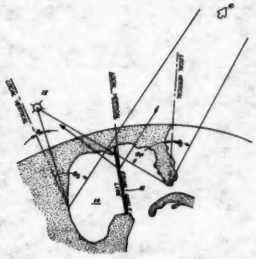
U.S. Cl. 374—124 **4 Claims**

1. A satellite method for measuring sea surface temperature comprising the steps of:

obtaining a temperature image data set comprising temperature data for each point of a common study area from each of two satellites nearly concurrently;

adjusting one of said temperature image data sets to form an adjusted temperature data set so that the values for each of said data sets are identical along a line across said study area where both satellites have equal observation angles relative to the local vertical from each of said satellites, the unadjusted temperature data set being a reference temperature image data set;

subtracting said adjusted temperature data set from said



reference temperature image data set to form a temperature difference image for said study area; and

calculating a corrected sea surface temperature data set for said study area by applying said reference temperature image data set, said temperature difference image and observation angles relative to a local vertical from each of said satellites for each point of said study area to an atmospheric model to compensate for the horizontal variability of the atmosphere.

4,611,930

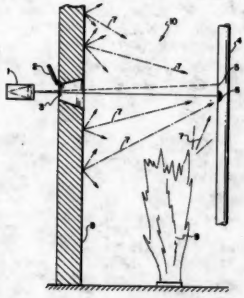
PYROMETER MEASUREMENTS IN THE PRESENCE OF INTENSE AMBIENT RADIATION

Alexander Stein, Secaucus, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 562,164, Dec. 16, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,160

Int. Cl.[4] G01J *5/06*

U.S. Cl. 374—126 **5 Claims**



1. A method for measuring the temperature of a remote sample in the presence of ambient radiation by observing its radiant emittance at about a given wavelength comprising:

(a) treating a portion of a surface of said sample with a refractory material selected to have a total emissivity about equal to that of an untreated surface of said sample while exhibiting a different spectral emissivity than said untreated surface at said wavelength, said wavelength being within the range of 1 μm to 3 μm;

(b) measuring the spectral radiance from said treated surface portion of said sample with a radiometer at about said given wavelength within the range 1 μm to 3 μm;

(c) measuring the spectral radiance from an untreated surface portion of said sample adjacent to said treated surface portion with a radiometer at about said given wavelength within the range 1 μm to 3 μm such that the surface temperature of said treated portion is about equal to said surface temperature of said adjacent untreated portion of said sample;

(d) obtaining the spectral emissivities of said untreated and said treated portions of said sample; and

(e) computing said temperature of said sample from the said radiances and emissivities of said treated and untreated surface portions using the Planck radiation formula.

4,611,931

SEALED ROLLER BEARING

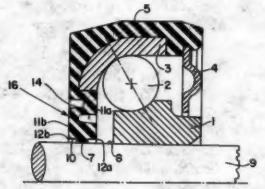
Manfred Brandenstein, Eussenheim; Ludwig Edelmann, Sulzthal, and Karl-Friedrich Kaschube, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,186

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 8410074[U]

Int. Cl.[4] F16C *33/72, 33/76;* **F16J** *15/32*

U.S. Cl. 384—477 **2 Claims**



1. Sealed roller bearing with a plastic jacket (5), adapted to form a seal (6) with a shaft (9) or the like, characterized in that the seal (6) has a bore surface (10) circumscribing the shaft and radially projecting circumferentially extending ring lips adjacent opposite axial ends of the bore surface having a diameter slightly less than the diameter of the shaft (9), said seal having radial side surfaces 11 and annular grooves (14) extending axially on both sides of the radial side surfaces (11) closely spaced to one another to form a hinge connection permitting a tilting action during assembly of the seal, one of said ring lips functioning as a tilting edge (12), which lifts the other ring lip radially from the sealing surface (8) of the shaft during axial displacement.

4,611,932

BEARING BUSHING FOR UNIVERSAL JOINTS

Armin Olschewski, Schweinfurt; Bernhard Bauer, Hassfurt, and Elisabeth Zirk, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 680,987

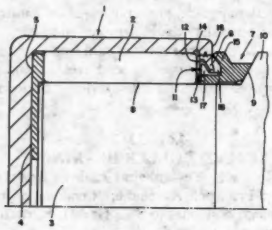
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 8336276[U]

Int. Cl.[4] F16L *33/78;* **F16D** *3/41*

U.S. Cl. 384—481 **1 Claim**

1. In combination, a bearing bushing for universal joints of generally cuplike form, a sealing ring for sealing a space between the bearing bushing and a shoulder of a machine part supported in the bushing, said machine part having a trunnion rotatably journalled in the bushing by a plurality of rollers in the space between the trunnion and interior of the bushing, a circumferentially extending radially inwardly directed flange at the open axial end of said bearing bushing defining an annu-

lar interior recess, said flange having a radially inwardly projecting abutment surface engageable by the axial ends of the rollers, said sealing ring having a radially outwardly directed circumferential projection engaging in said annular recess interiorly of said flange and spaced axially from the ends of the rollers a greater distance than said abutment surface, and means defining at least one axial opening in said sealing ring



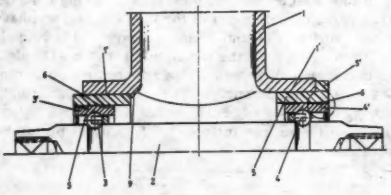
defining a passage connecting the running space of the bearing with an annular space outboard of the flange bounded by said flange and sealing ring, an elastic circumferentially extending outer sealing lip which bears against the lateral outer surface of said flange facing away from the rolling elements and engages said flange with a predetermined pretension and biases the seal in a direction away from the rolling elements.

4,611,933

FASTENING OF ANTI-FRICTION BEARINGS

Heinrich Hofmann, Schweinfurt, and Horst Ulsenheimer, Dittelbrunn, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafter (KGaA), Fed. Rep. of Germany

Continuation of Ser. No. 485,032, Apr. 14, 1983, abandoned.
This application Apr. 12, 1985, Ser. No. 722,676
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216958
Int. Cl.[4] F16C *43/04*
U.S. Cl. 384—512 **25 Claims**



1. An anti-friction bearing for fastening a housing to a shaft, the bearing comprising:

the shaft having defined in it an inner race for bearing elements for axially holding the bearing elements;

an outer race radially outside the inner race;

bearing elements supported between the inner and outer races on the shaft;

the housing being radially outside the outer race and spaced therefrom; and

an intermediate sleeve of deformable material disposed between the housing and the outer race, at least one of the housing and the outer race having withdrawal prevention means thereon between the sleeve and said at least one of the housing and the outer race for preventing the sleeve from being withdrawn from between the outer race and the housing;

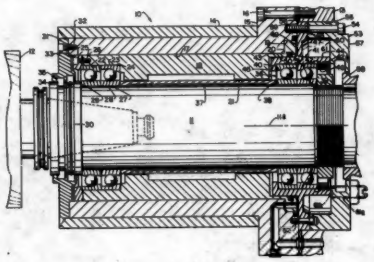
the intermediate sleeve having a generally L-shaped profile in cross-section.

4,611,934

DEVICE FOR PRELOADING BEARINGS

Tadeusz W. Piotrowski, and Horst E. Maack, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 9, 1985, Ser. No. 773,753
Int. Cl.[4] F16C *23/06, 25/06, 43/04*
U.S. Cl. 384—517 **8 Claims**



1. In a spindle support system, having first and second spaced-apart bearings carrying a rotatable spindle in a housing where said bearings are mounted in a predetermined squareness attitude with respect to said spindle and where said first bearing is axially fixed with respect to said spindle and housing, an improved device for effecting an axial load level between said bearings, comprising:

support means for permitting movement of said second bearing in an axial direction relative to said first bearing, between a first load level position and a second load level position;

stop means for positively limiting axial movement of said second bearing and for maintaining said attitude of said second bearing; and

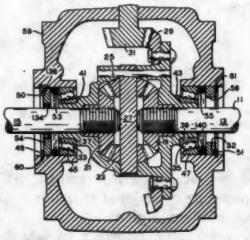
force means for powering said second bearing between said positions and for holding said second bearing in said attitude at a force load level greater than said second load level.

4,611,935

ADJUSTABLE SHAFT SUPPORT ARRANGEMENT

John E. Rode, Albany, N.Y., assignor to Temper-Ring Equipment Corporation, Fonda, N.Y.

Division of Ser. No. 407,992, Aug. 13, 1982, Pat. No. 4,492,018.
This application Dec. 20, 1984, Ser. No. 683,875
Int. Cl.[4] F16C *19/24, 23/06*
U.S. Cl. 384—548 **8 Claims**



1. An arrangement of thrust carrying bearings and deformable spacing elements rotatably supporting an axially extending shaft within a housing, the housing having an interior and an exterior, a critical dimension determining element within the housing interior, and a shaft portion which limits shaft movement in one axial direction, the arrangement including a pair of

incompressible discs slidable in the housing and adjacent to the spacing elements with one of the discs being limited in sliding movement in said one axial direction towards the direction of the exterior of the housing and the other of the discs being limited in sliding movement toward the interior of the housing wherein each bearing is adjacent a corresponding spacing element with the spacing element, adjacent bearing and adjacent disc axially captive between the housing and the shaft.

4,611,936

THERMAL PRINTER

Tsuneo Yasui, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

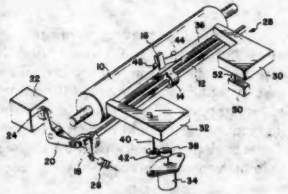
Continuation of Ser. No. 569,195, Jan. 9, 1984, abandoned. This application May 29, 1985, Ser. No. 738,900

Claims priority, application Japan, Jan. 26, 1983, 58-10918

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **1 Claim**



1. A thermal printer capable of printing with a thermal print head which moves along a platen on a sheet of ordinary paper through a thermal ribbon having a thermally transferable ink layer, and also capable of printing with a thermal print head directly on a sheet of thermal paper without using said thermal ribbon; said thermal printer comprising

means for reciprocally moving said thermal head along said platen for bidirectional printing operation in both modes when said thermal ribbon is used and also when said thermal ribbon is not used;

paper feed means for feeding a paper supported on said platen, said paper being either said sheet of ordinary paper or said sheet of thermal paper;

a pair of ribbon holders;

detecting means comprising a microswitch actuatable by at least one of said pair of ribbon holders, for sensing presence and absence of said thermal ribbon to determine whether said thermal ribbon is available to be used or not to be used in printing operation, said detecting means generating a signal according to the presence and absence of said thermal ribbon;

head release means for moving said thermal print head from a printing position whereat said thermal head is placed directly in contact with said sheet of thermal paper, and alternatively, indirectly through said thermal ribbon in contact with said sheet of ordinary paper, to a release position whereat said thermal head is released away from said sheet of thermal paper or away from said thermal ribbon and said sheet of orginary paper;

ribbon feeding means responsive to said detecting means detecting presence of said thermal ribbon for feeding said thermal ribbon from one of said pair of ribbon holders to the other of said pair of ribbon holders so that an unused part of said thermal ribbon is located opposite to and between said thermal head and said sheet of ordinary paper;

memory means for temporarily storing print data for one printing line;

drive mean for actuating said head releasing means to move said thermal head from said printing position to said release position, upon completion of printing operation for one printing line, said paper feed means being thereafter actuated to feed by a predetermined length said sheet of thermal paper and, alternatively, said sheet or ordinary paper; and

control means actuated by a signal from said detecting means indicating absence of said thermal ribbon for controlling said drive means to cause said head release means to hold said thermal head at said release position after completion of printing operation for one printing line for a first predetermined period of time until said paper feed means completes thermal paper feed action without an operation of said ribbon feeding means; said control means actuated by a signal from said detecting means indicating presence of said thermal ribbon for controlling said drive means to cause said head release means to hold said thermal head at said release position after completion of printing operation for one printing line for a second predetermined period of time until said paper feed means completes ordinary paper feed action and said ribbon feed means completes thermal ribbon feed action, said ordinary paper feed action and said ribbon feed action occurring sequentially.

4,611,937

RIBBON FEED MECHANISM FOR A PRINTER

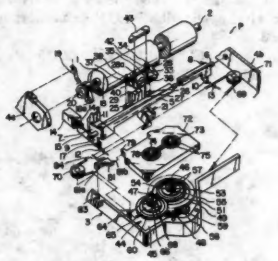
Yoshiaki Sato, and Osamu Takahashi, both of Kashiwazaki, Japan, assignors to Silver Seiko Ltd., Kashiwazaki, Japan

Filed Jan. 13, 1984, Ser. No. 570,637

Claims priority, application Japan, Jan. 19, 1983, 58-5797

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **19 Claims**



1. In a printer having a stationary section, a platen on said stationary section, a bidirectional drive means on said stationary section, a carrier operatively connected to said drive means for back and forth translatory movement thereby to and from a left margin position along said platen, a print head mounted for translatory movement together with said carrier, and a ribbon feed mechanism including a supply spool and a takeup spool for feeding a print ribbon past said print head, the improvement wherein said ribbon feed mechanism comprises:

first clamp means mounted on said stationary section and selectively operable between an operative position in which said first clamp means clamps a first portion of the print ribbon between said print head and said takeup spool and an inoperative position in which said first clamp means clamps no portion of the print ribbon;

second clamp means mounted on said carrier and selectively operable between an operative position in which said second clamp means clamps another portion of the print ribbon between said supply spool and said first portion of the print ribbon and an inoperative position in which said second clamp means clamps no portion of the ribbon;

means for selectively actuating said first and second clamp means and operable throughout the range of back and forth translatory movement of the carrier between a first actuating position in which said first clamp means and said second clamp means are actuated to respective operative

and inoperative positions and a second actuating position in which said first and second clamp means are actuated to respective inoperative and operative positions;

first ribbon driving means disposed for rotation about a first axis fixed relative to said stationary section and operatively connected to said drive means for impositively driving said supply spool to wind the print ribbon onto said supply spool when said drive means operates to move said carrier toward said left margin position and for unwinding the print ribbon therefrom when said drive means operates to move said carrier away from said left margin position; and

second ribbon driving means disposed for rotation about a second axis fixed relative to said stationary section and operatively connected to said drive means for impositively driving said takeup spool to wind the print ribbon onto said takeup spool when said drive means operates to move said carrier toward said left margin position and for unwinding the print ribbon therefrom when said drive means operates to move said carrier away from said left margin position.

4,611,938

MECHANISM FOR RAISING AND FEEDING INK RIBBONS IN TYPEWRITERS AND SIMILAR MACHINES

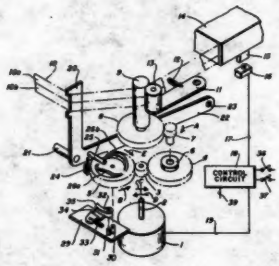
Wilfried Rettke, Altdorf, and Ladislav Tunys, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph Adler AG, Nuremberg, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,451

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301933

Int. Cl.⁴ B41J *33/54, 33/56*

U.S. Cl. 400—212 **8 Claims**



1. Mechanism for raising and feeding according to type any of a plurality of types of inked print ribbons comprising

a ribbon feed gear wheel,

a ribbon lift gear wheel having cam means,

a follower engaging said cam means to be driven thereby to raise a ribbon guide,

a stepper motor including an output gear coupled to rotate said feed and lift gear wheels through various angles,

a microcomputer including a plurality of stored programs corresponding to types of print ribbons to be used, and

input means signalling said computer to select from the stored programs the one corresponding to the ribbon type selected for use,

said selected stored program causing said microcomputer to issue a predetermined number of motor energizing pulses to effect rotation through a predetermined angle whereby the magnitude of ribbon lift and ribbon feed is controlled according to the selected type of print ribbon in use.

4,611,939

SHEET FEEDING DEVICE FOR AN IMPACT-TYPE PRINTER

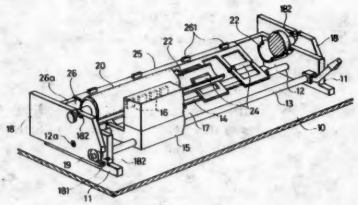
Shinsuke Fujiwara, Osaka, Japan, assignor to NEC Home Electronics Ltd, Osaka, Japan

Filed Nov. 28, 1984, Ser. No. 675,321

Claims priority, application Japan, Nov. 30, 1983, 58-226290

Int. Cl.⁴ B41J *13/02*

U.S. Cl. 400—637 **7 Claims**



1. In a printer of the type having a printing mechanism carrying printing heads, first and second guide shafts for mounting said printing mechanism for reciprocal longitudinal movements, said first guide shaft mounted for a pivotal movement about its longitudinal axis, a platen in confronting relationship to said printing heads, and a sheet feeding device for feeding paper sheets along a supply path on the periphery of said platen, the improvement wherein said sheet feeding device comprises:

plural pressure roller means for pressing a paper sheet against said platen;

leaf spring means having one end fixed to said printer and a second end opposite to said one end, said leaf spring means being the sole support for said pressure roller means, said leaf spring means exerting a bias force to bias said roller means into a displaced position wherein said roller means are spaced from said platen, said leaf spring means being displaceable, against said bias force, to move said roller means into a pressing position wherein said roller means are in pressing engagement against said platen to capture a paper sheet therebetween; and

cam means associated with said pivotal first shaft and engaging said second end of said leaf spring means, said pressure roller means being supported between said fixed end and the area of engagement of said cam means with said leaf spring means cam means displacing said leaf spring means against said bias force to move said roller means from said displaced position and into said pressing position in response to selective rotation of said first shaft.

4,611,940

PRINTER OF THE DOT IMPACT TYPE

Hideaki Takenoya, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,211

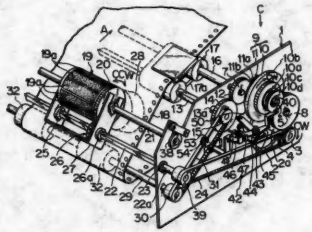
Claims priority, application Japan, Jun. 17, 1983, 58-92115[U]

Int. Cl.⁴ B41J *11/057*

U.S. Cl. 400—649 **4 Claims**

1. A printer of a dot impact type, comprising a printing head, a platen arranged so that a printing paper is guided between the printing head and the platen, the platen having an outer circumference and on the latter a plurality of sintered bodies containing different colors of ink and engagable with the printing paper, said platen and said printing head being movable in a letter space direction within at least a printing region, said platen being rotatable so as to change the color ink by changing the position of the ink containing sintered bodies; a drive device including a motor rotatable in clockwise and counterclockwise directions, feed means for feeding said paper in a

linespace direction, a one-directional clutch arranged to transmit rotation of said motor to the feed means in said line space direction during rotation of the motor in a clockwise direction and to change the color by rotation of said platen during rotation of the motor in a counterclockwise direction; and means responsive to movement of said printing head beyond said printing region to switch the one directional clutch to transmit rotation of said motor to said feed means in both directions.

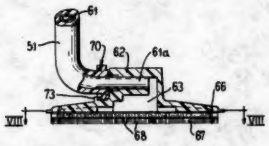


4,611,941

PRESSURIZED PAINT PAD MOUNTING

Rudolf R. Karliner, Minnetonka, and Gerald E. Peterson, St. Paul, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Apr. 19, 1984, Ser. No. 602,132
Int. Cl.[4] B05C *17/00*
U.S. Cl. 401—207 **4 Claims**



1. A pad assembly for connection to a pressurized paint supply system comprising a hollow arm, a paint delivery tube secured coaxially within said arm and having an end portion extending therebeyond, a pad support having a housing receiving said end portion therein, an absorbent pad carried by said pad support, and locking means cooperating between said pad support and said hollow arm to position said pad support selectively in a paint applying angularly adjustable position wherein said pad support is axially restrained from disengagement with said end portion and a release position in which said pad support is slidably disengageable in its entirety from said end portion, said locking means including a disk at the end of said hollow arm having at least one slot therein and stop means angularly spaced from said slot, said pad support having a raised projection thereon over which said slot is slidable in disengaging said pad support from said hollow arm, said stop means preventing axial movement of said pad support when said projection is out of registry with said slot and providing sliding disengagement when in registry with said slot.

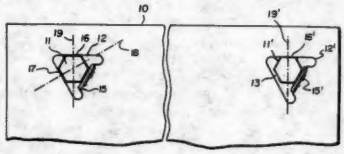
4,611,942

SHEET REGISTRATION MEANS

John E. Morse, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,101
Int. Cl.[4] B42F *13/00, 13/12*
U.S. Cl. 402—79 **5 Claims**

1. In a sheet registration means including locating means associated with a plane in combination with registration edge elements on a sheet for registering the sheet in the plane, the sheet having one or more flaps formed on the sheet; and the improvement which comprises:
wherein the one or more flaps cooperate with means external



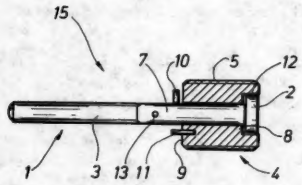
to the sheet for resiliently biasing a total of only three registration edge elements of the sheet against the locating means and wherein the registration edge elements are so oriented relative to each other as to form well separated centers of rotation.

4,611,943

CONNECTOR FOR ASSEMBLING TWO STRUCTURAL MEMBERS

Börje Bengtsson, Bjärnum, Sweden, assignor to Inter-Iken AG, Lucerne, Switzerland

Filed May 20, 1985, Ser. No. 735,637
Claims priority, application Denmark, May 24, 1984, 2549/84
Int. Cl.[4] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—22 **11 Claims**



1. A connector for connecting two elements, such as a table top and a table leg, said connector comprising: an elongated shaft having a threaded portion and a relatively smooth portion connected to said threaded portion; a bushing extending around said smooth portion; cooperating stop means on said bushing and said shaft for limiting rotation of said bushing around said smooth portion to an angle of less than 360°; and means for fixing said bushing axially in position on said smooth portion, whereby said bushing may be connected to one of said elements, the threaded portion screwed into the other element until the two elements tightly engage each other, and the one element rotated into a desired angular position with respect to the other element.

4,611,944

LOCKBODY MECHANISM

Wallace H. Larson, Jamestown, N. Dak., assignor to Western Gear Corporation, Jamestown, N. Dak.

Filed Feb. 9, 1984, Ser. No. 578,483
Int. Cl.[4] F16B *7/06*; F16D *1/12*
U.S. Cl. 403—60 **12 Claims**

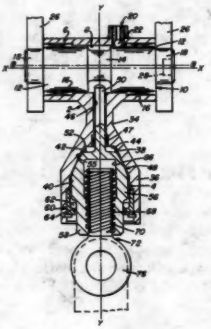
1. A mechanism comprising,
a first member having an elongated first bore extending inwardly thereof along an axis with at least one end of said bore being open and facing in one axial direction;
a second member having at least an elongated portion

thereof supported by said first member for rotation within said first bore;

said second member having an elongated second bore extending inwardly thereof in coaxial alignment with said axis and with an open end thereof facing in said one axial direction;

a third member having at least an elongated portion thereof received within said second bore in coaxial alignment with said axis;

said elongated portion of said third member and said elongated second bore having cooperable means to permit said second and said third members to rotate relative to each other and to permit said third member to move in either axial direction along said axis with respect to said second member;



said third member having a portion located outwardly of said second bore which is adapted to be secured to a rigid structure;

and a selectively actuatable means carried by said first member for selectively moving said first member into and out of engagement with said elongated portion of said second member, with said second member being restrained from rotation with respect to said first member and said third member when said first member engages said elongated portion of said second member, and with said elongated portion of said second member being free to rotate within said first bore when said first member is out of engagement with said elongated portion of said second member.

4,611,945

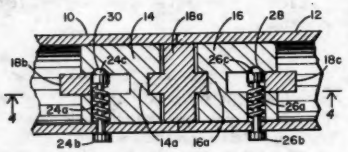
ARTICULATING JOINT FOR FOLDING TUBULAR SECTIONS

Dennis F. Diego, 2129 Penasquitas Dr., Aptos, Calif. 95003

Filed Jun. 7, 1985, Ser. No. 742,706

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—61 **15 Claims**



1. In combination with two tubular members, articulating means for coupling said tubular members, comprising:

a central portion having a longitudinal axis,

flanges extending from opposing sides of said central portion in a direction parallel to said axis,

plug means pivotably attached to each of said flanges,

means for releasably fixing each of said plug means to said flange means so that said plug means can assume a first, axially aligned position and a second angularly disposed position wherein said plug means are disposed at an angle of at least 90°,

each of said plug means, said central portion and said flanges having an external configuration for telescopic receipt within the internal configuration of said tubular members, and each of said plug means being received in one of said tubular members and fixed therein by fixing means,

whereby said articulating means are housed entirely within said tubular members in said first position so that adjacent ends of said tubular members are positioned in abutting axial alignment while said articulating means housed in the joined tubes aids in resisting axial, transverse, bending and torsion loads at their juncture.

4,611,946

FLEXIBLE JOINT

Sven R. V. Gebelius, P.O. Box 15008, Bromma, Sweden (S-161 15)

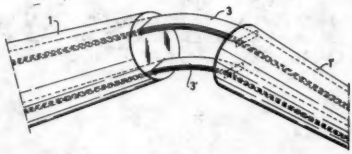
PCT No. PCT/SE84/00136, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04140, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 12, 1984, Ser. No. 689,047

Claims priority, application Sweden, Apr. 15, 1983, 8302109

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—102 **11 Claims**



1. A flexible joint comprising:

at least two plate spring members extending in spaced substantially parallel relationship each having an end portion at opposite ends thereof;

a first element;

first end portions of said spring members being attached in adjacent spaced relationship to said first element;

a second element; and

opposite end portions of said spring members being moveably attached to said second member so that displacement movement of said spring members of substantially the same amount relative to said second element displaces said first and second elements substantially linearly with respect to each other, and displacement movement of said spring members of different amounts relative to said second element pivots said first element with respect to said second element in the plane substantially passing through said plate spring members in the direction of said plate spring member having the smallest degree of movement.

4,611,947

COUPLING ASSEMBLY FOR JOINING TWO PROFILED RAILS

Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Mar. 5, 1984, Ser. No. 585,999

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310005

Int. Cl.[4] F16B *7/00*; F16D *1/12*

U.S. Cl. 403—104 **7 Claims**

1. A coupling assembly comprising:

a multi-walled first elongated profiled hollow rail having a longitudinal axis, an inner space running along said axis

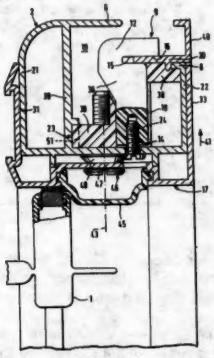
and an opening through at least a first wall of said first rail, said opening extending essentially over the full length of said first rail and giving access to said inner space;

a clamping element having a bearing surface and being constructed of a size and shape to allow passage thereof across said opening, said clamping element being formed with a threaded hole;

means mounting said clamping element in said inner space for non-rotational but translational movement relative to said axis;

means defining a fixed clamping surface in said inner space, said clamping surface and said bearing surface defining therebetween a clamping gap;

said first profiled rail having a second wall formed with a hole therethrough facing said threaded hole of said clamping member;



a screw extending freely through said second wall hole and screwed into said threaded hole of said clamping member so that rotation of said screw causes said translational movement of said clamping member and variation in the width of said clamping gap; and

a second profiled rail having a leg inserted into said clamping gap, whereby rotation of said clamping screw in one direction increases the clamping pressure on said leg to secure said profiled rails together and rotation of said screw in reverse direction loosens said pressure and frees said profiled rails from one another so as to allow relative spatial adjustment of said rails; and

wherein said opening is formed at a corner of said first rail defined by imaginary extensions of said first wall and of a third wall of said first rail, and wherein said means defining said clamping surface is an inwardly turned web at the edge of said third wall, said web being parallel with said first wall.

4,611,948

BOAT TRAILER WITH PIVOTAL DROPPED CROSSBAR ROLLED MOUNTING SYSTEM

Lawrence N. Johnson, W. 130 Highdrive, Spokane, Wash. 99203

Division of Ser. No. 65,118, Aug. 9, 1979, Pat. No. 4,530,634. This application Apr. 26, 1985, Ser. No. 727,721

Int. Cl.⁴ B25G *3/00*; **F16B** *7/08*

U.S. Cl. 403—232.1 **8 Claims**

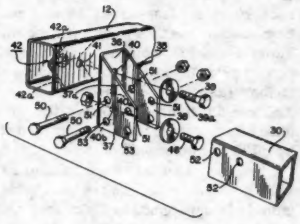
1. A bracket assembly for connecting a cross support member to a longitudinally extending side frame member of a boat trailer comprising

a bracket member having a U-shaped cross sectional configuration formed by a base section and a pair of spaced side sections extending therefrom,

said pair of spaced side sections adapted to embrace an end of a cross support member for attachment thereto,

shaft means for coupling said bracket member to a longitudinally extending side frame member,

said shaft means being disposed through said base section of the bracket member in a direction transverse to the longitudinal axis of a longitudinally extending side frame mem-



ber for supporting said bracket member for pivotal movement relative to the longitudinally extending side frame member, and

stop means supported on said base section to limit the extent of pivotal movement of said bracket member.

4,611,949

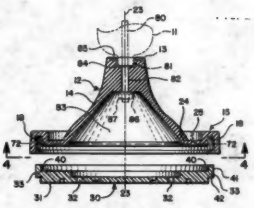
DETACHABLE BASE FOR ROAD DELINEATORS

Donald W. Schmanski, Carson City, Nev., assignor to Carsonite International Corporation, a Division of AMETEK, Carson City, Nev.

Continuation-in-part of Ser. No. 572,366, Jan. 20, 1984, Pat. No. 4,571,118, and a continuation-in-part of Ser. No. 311,350, Oct. 14, 1981, Pat. No. 4,511,281. This application Nov. 29, 1984, Ser. No. 676,803

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 404—9 **17 Claims**



1. A deformable, detachable base for supporting and stabilizing an attached vertical sign or delineator member in upright orientation with respect to a ground or road surface to which the base may be affixed, said base comprising:

a. a deformable, resilient, domed structure having an integrally formed (i) top, (ii) intermediate body wall and (iii) base attachment channel, said channel being formed of a resilient, elastic composition at the periphery of the body wall and including an inward channel wall forming one side of a channel enclosure and an outward channel wall coupled at its top to the inward channel wall forming another side of the channel enclosure and further including a flange attached at a lower part of the outward channel wall and projecting inward toward a central axis thereof to thereby form a third wall for the channel enclosure, said domed structure being configured about the central axis in the general shape of a dome;

b. a rigid, flat base plate adapted near its periphery with a substantially vertically oriented lip adapted in size and configuration for removable attachment in a tight, contour fir within the three channel walls of the channel

enclosure and being further adapted with means for attachment to the ground or other flat mounting surface;

c. said domed structure including means at the top thereof for mounting a delineator or sign member, said mounting means providing a primary transfer path for stress occurring as a result of impact between a fast moving vehicle and the attached delineator or sign member wherein impact forces are transferred directly into the top of the dome and indirectly through the intermediate body wall into the base attachment channel, said indirect forces being operable to tighten the attachment of the base attachment channel at the base plate;

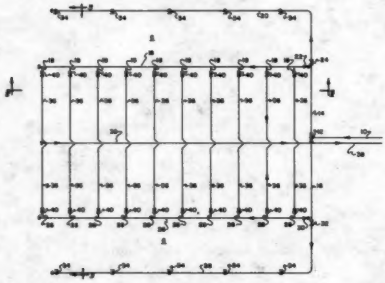
d. said base attachment channel further providing for immediate detachment at the base plate by direct forces applied by lifting the outer wall of the channel to insert the lip of the base plate therein, yet being adapted at the same time to resist detachment from the base plate in response to the indirect forces applied to the channel through the domed structure wherein forces are distributed over the walls of the channel and where increased frictional contact with the base plate prevents release of the lip from the channel enclosure.

4,611,950

METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM SOIL

Richard J. Russomano, Chatham, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 21, 1984, Ser. No. 653,101
Int. Cl.[4] G21F *9/20*
U.S. Cl. 405—128 **9 Claims**



1. An apparatus for removing contaminants from soil comprising:

a source of water,

a first and a second conduit system;

means connected to said water source for selectively circulating water to said first and second conduit systems;

means connected to the first conduit system for discharging water flowing through said first conduit system to said soil to form a mixture of contaminants and water;

means connected to the second conduit system for continuously circulating said water through said second conduit system; and

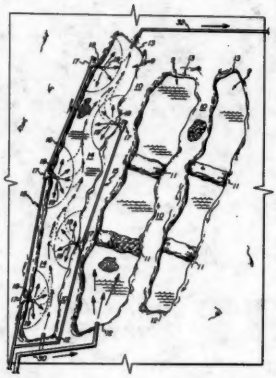
venturi means in said second conduit system for creating a reduced pressure in a portion of said second conduit means in response to said continuous circulation for drawing said mixture from said soil into said second conduit system for continuous circulation therethrough.

4,611,951

PROCESS FOR RECLAMATION OF EXCAVATED MINE SITES

Bobby L. Sapp, Plant City, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 7, 1985, Ser. No. 785,296
Int. Cl.[4] E02D *3/10*; B01D *21/01*
U.S. Cl. 405—128 **7 Claims**



1. A method for disposal of waste slimes and tailings from hydraulically processed surface mined ore and the reclamation of excavated mine sites and land depressions therewith, comprising:

(a) forming the excavated mine site or land depression into an elongated cut in which the ratio of the length to width thereof is about 5 to 1 to 15 to 1 using overburden to raise the banks of said cut to the original elevation of the land mass before it was mined;

(b) providing dikes at both ends of the cut of equal elevation level with the top of the side banks of said cut and installing across said cut at intervals throughout its length, low level dikes about one-third of the depth of the cut;

(c) filling the thus-prepared cut with slimes containing from 0.0 to 1.5 kg of a flocculant/ton of slimes, permitting said slimes to settle to a solids concentration between about 15% and 20% (dry basis) and then draining released water from above the settled slimes;

(d) mixing sand tailings with an aqueous slimes suspension containing flocculant and about 3% to 5% by weight (dry basis) of ultrafine clay solids;

(e) pumping the thus-prepared sand-slimes-flocculant mixture to a multiple discharge spray assembly provided along the banks of the slimes-filled cut and initiating spraying of said mixture over the settled slimes from the spray head at the top of the cut;

(f) continuing spraying of said mixture from said spray head until a cap of about 2 to 3 feet in depth of sand-slimes-flocculant is developed over the settled slimes and some heaving of the sand and slimes along the periphery of the cap is observed;

(g) reducing or terminating spraying at the spray head when heaving is observed and initiating spraying from the spray head on the opposite bank and immediately down stream of the observed heaving;

(h) developing caps, as described above, along the extent of the slimes-filled cut thereby producing a sand-slimes pattern in the cut that imparts a serpentine movement to (a) water released from the settled slimes or spray mixture, and (b) to any slimes or sand-slimes mixture which are heaved along the peripheries of the developing caps; and

(i) advancing the spray heads over the caps toward the opposite banks of the cut until the caps overlap and the

sand-slimes-flocculant mixture between the advancing caps heave; and, thereafter working the heaved sand-slimes-flocculant mixture into the cap and then grading the filled cut.

4,611,952

METHOD OF FABRICATING THE LINES OF A TAUT-LINE PLATFORM AND OF PREPOSITIONING THEM PRIOR TO FINAL FIXING

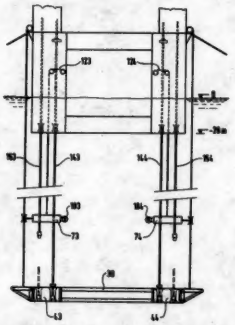
René-Pierre Saint-M'Leux, Savenay, France, assignor to Institut Francais du Petrole; Bouygues Offshore; Compagnie Francaise d'Entreprises Metalliques CFEM; Alsthom Atlantique and Compagnie General pour les Developpements Operationnels des Richesses Sous-Marines CG Doris, all of, France

Filed Nov. 14, 1984, Ser. No. 671,377

Claims priority, application France, Nov. 14, 1983, 83 18018

Int. Cl.[4] E02D *5/54*

U.S. Cl. 405—224 **1 Claim**



1. A method of fabricating and prepositioning prior to final fixing the lines of a taut line floating platform, said platform comprising p groups of n lines each, the lines being fitted at their lower ends with respective connectors for engaging respective latching receptacles disposed on a base having np receptacles and fixedly placed on the sea bottom, the platform comprising p identical columns disposed around a regular polygon, each column comprising a line fabricating station, a gantry for handling the lines, a first winch, and a second winch, the platform comprising opposite to each column n openings through which the lines are lowered as they are fabricated, prepositioning being achieved when the connectors of all of the lines are placed at a distance of about one meter vertically above the corresponding receptacles, wherein the method comprises the following operations:

preparing a floating spacer frame that is submersible by ballasting, said frame being constituted by a flat metal structure having p groups of vertical openings disposed in the same manner as said p columns, each group of openings comprising n channels disposed in the same manner as the lines of a group;

preparing p shuttles, each constituted by a metal structure of horizontal size close to that of a group of and including in each line a resilient stop located a few meters from its bottom end;

operating the first winches to lower the assembly constituted by the frame and the shuttles until the frame rests on the resilient stops of the lines, the end of each of the p lines then lodging in an opening through the frame, and the frame then being a few tens of meters from the base;

operating the second winches to raise the shuttles until they make contact with the bottom of the platform;

successively fabricating and lowering the 2nd, 3rd, . . . and n-th lines of the p groups at the rate at which they are fabricated by operating the gantry, the lines being guided by maneuvering the shuttle by means of the second winches, and each line of each group passing through an appropriate opening in the shuttle of its group;

when all the lines have been lowered by a last shuttle descent, fixing the shuttles to the frame;

bringing the platform-frame assembly over the base by tug means, with the exact orientation of the frame being provided by operation of the shuttle thruster means;

lowering the frame-shuttle assembly to within about one meter of the base by ballasting the platform, providing accurate guidance in horizontal directions by openings through the frame, comprising releasable lower means for fixing to the frame and releasable upper means for fixing to the floating platform, means for suspension from said second winch, guide means against rotation, and horizontal plane thrust means;

fixing the shuttles to the frame, with each shuttle being disposed opposite a group of openings through the frame;

submerging the frame and leaving it suspended at a depth of about forty meters from floats;

bringing the platform vertically over the frame;

fixing the frame to the cable of the first winch in each group;

raising the frame until the shuttles come into contact with the platform, opposite the openings in the platform;

fixing the shuttles to the platform;

casting off the frame floats;

fabricating, in each column, a first line of each group to its final length by fixing line components end-to-end, supporting and progressively submerging the line vertically from the gantry as it is fabricated, passing the line through the openings in the platform, in the shuttles, and in the frame, and including in each line a resilient stop located a few meters from its bottom end;

operating the first winches to lower the assembly constituted by the frame and the shuttles until the frame rests on the resilient stops of the lines, the end of each of the p lines then lodging in an opening through the frame, and the frame then being a few tens of meters from the base;

operating the second winches to raise the shuttles until they make contact with the bottom of the platform;

successively fabricating and lowering the 2nd, 3rd, . . . and n-th lines of the p groups at the rate at which they are fabricated by operating the gantry, the lines being guided by maneuvering the shuttle by means of the second winches, and each line of each group passing through an appropriate opening in the shuttle of its group;

when all the lines have been lowered by a last shuttle descent, fixing the shuttles to the frame;

bringing the platform-frame assembly over the base by tug means, with the exact orientation of the frame being provided by operation of the shuttle thruster means;

lowering the frame-shuttle assembly to within about one meter of the base by ballasting the platform, providing accurate guidance in horizontal directions by the shuttle thruster means, and by center posts mounted on the base entering guide cones provided in the frame; and

stowing the frame on the base by operating the first winches, whereby the ends of the lines may then heave freely in the openings of the frame at a distance of about one meter from the connectors.

4,611,953

TLP TENDON BOTTOM CONNECTOR

Henry S. Owens, Santa Barbara, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Nov. 1, 1985, Ser. No. 793,503

Int. Cl.[4] E02D *5/74;* **F16B** *1/04*

U.S. Cl. 405—224 **23 Claims**

1. A bottom connector for connecting a tendon segment of a tension leg platform to a subsea template which includes a receptacle for said connector comprising

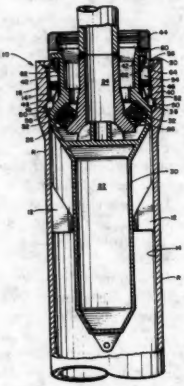
a first body member adapted to be received within an anchor receptacle,

a second body member connected to the first body member

through a flexible joint for universally pivotal movement and adapted to be connected to the tendon segment,

a latch carrier movable with respect to said first body member and having latch segments pivotally connected to said latch carrier,

said latch segments being such that in one position of said latch carrier, said latch segments engage both a recess in the receptacle and the firstbody member when the connector is inserted into said receptacle a sufficient distance



so that said latch segments and carrier will react to said recess and such that when the latch carrier is in another position, the latch segments are clear of said recess to enable said connector to move further into said receptacle or to allow said bottom connector to be removed from said receptacle, and

release means operative to maintain said carrier in said other position if a decision is made to remove said connector from said receptacle.

4,611,954

APPARATUS AND METHOD FOR MINE INSTALLATIONS

Bruce A. Cassidy, Richmond, Ohio, assignor to Republic Corporation, Century City, Calif.

Filed Sep. 25, 1984, Ser. No. 654,130

Int. Cl.[4] E21D *20/02, 21/00*; **F16B** *33/04*

U.S. Cl. 405—261 **12 Claims**

1. An apparatus for anchoring a bolt in a rock formation comprising:

an elongated bolt adapted for use in a bore hole in said rock formation, said bolt having a first and second portion, said first portion being threaded;

a tensioning plug having first and second ends and inner and outer walls, said tensioning plug defining an aperture therethrough;

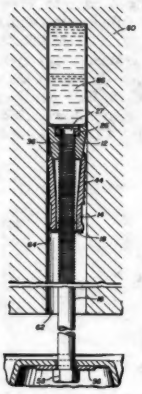
said tensioning plug inner wall being threaded at a first end to engage said bolt first portion, said threads having an inner surface;

resistance means affixed to said tensioning plug inner wall at said second end, said resistance means defining an opening and being coaxial with said tensioning plug;

an expandable sheath having a base and a plurality of longitudinal extensions stemming from said base, said sheath defining an aperture therethrough;

each of said extensions having an outer surface designed to engage the wall of the bore hole and an inner surface, the outer wall of said tensioning plug first end disposed adjacent the inner surface of the extensions, said tensioning plug thereby resting within the sheath aperture and being coaxial therewith, said sheath and plug being held in abutting relation;

said bolt first portion extending through said sheath aperture and said plug aperture and abutting said resistance means thereby preventing axial movement of said bolt upon application of a torque beyond a predetermined point in said tensioning plug aperture and causing said bolt, said sheath and said tensioning plug to rotate together; and



said bolt threaded first portion threading into said resistance means upon application to said bolt of a torque in excess of a predetermined torque and thereby allowing relative rotation between said bolt and said tensioning plug, said plug being non-rotatably drawn axially along said bolt so as to expand said extensions to anchor the bolt in a bore hole and permit said bolt to be placed under tension in said bore hole.

4,611,955

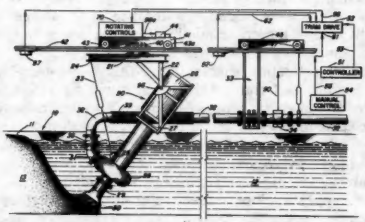
SLURRY PUMP TRAM CONTROL APPARATUS

Richard E. Doerr, Morgantown, W. Va., assignor to Conoco Inc., Ponca City, Okla.

Filed Jul. 23, 1980, Ser. No. 171,600

Int. Cl.[4] B65G *53/66*

U.S. Cl. 406—31 **3 Claims**



1. In a sump having substantially parallel and elongated sidewalls defining a longitudinal axis, ends and a bottom adopted for filling with a water solid matter mixture, a suction pump to remove said solid material and water and slurry, and means for moving said suction pump along said longitudinal axis, and hose means connected to the outlet of said suction pump, and wherein said suction pump is moved in a first line parallel to an elongated side between said side and the longitudinal axis of said sump and arcuately revolved at one end thereby moving said suction pump from said former line to a

second position along a second line parallel to said remaining elongated side intermediate said side and said longitudinal axis and arcuately revolved in a direction counter to said previous arcuate rotation to said first line, an improvement in the method of maintaining a predetermined concentration in the slurry by said suction pump as it moved along said first or second line comprising:

(a) determining the concentration of said slurry in said hose means, and

(b) moving said suction pump at a rate to maintain said concentration at a predetermined value.

4,611,956

METHOD FOR FABRICATING BEVEL AND HYPOID GEAR PAIRS

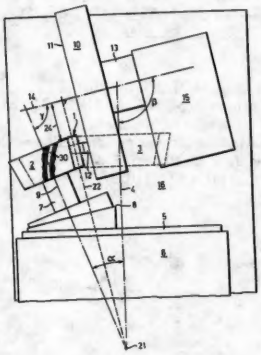
Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Continuation-in-part of Ser. No. 449,422, Dec. 13, 1982, abandoned, which is a continuation of Ser. No. 170,759, Jul. 21, 1980, abandoned. This application Aug. 16, 1984, Ser. No. 641,387

Claims priority, application Switzerland, Aug. 16, 1979, 7498/79

Int. Cl.⁴ B23F *9/10*

U.S. Cl. 409—26 **9 Claims**



1. A method of manufacturing bevel and hypoid gear pairs, comprising one gear having a longitudinal axis and a mating gear having a longitudinal axis wherein a finished gear pair has a small cone angle, by cutting-out tooth spaces with a face-mill cutter head which rotates about an axis of rotation, comprising the steps of:

clamping a first gear blank for the one gear of a gear pair upon a first spindle arranged upon a pivotable part arranged at a generating drum which is rotatable about a generating axis and wherein said pivotable part is pivotable out of a position parallel to said generating axis;

clamping the face-mill cutter head upon a second spindle arranged upon a headstock;

setting the first spindle upon a machining axis for manufacturing the one gear of the gear pair such that said longitudinal axis of the one gear coincides with said machining axis, the machining axis being inclined at an acute angle with respect to the generating axis and wherein a relative position of the machining axis and the generating axis to one another is essentially the same as that of said longitudinal axes of the one gear and the mating gear of the finished gear pair when the finished gear pair is in mesh;

setting the second spindle such that the axis of rotation of the face-mill cutter head is disposed approximately perpendicularly to a generatrix which is common to a pitch surface of the one gear to be fabricated and to a pitch surface of the mating gear imaginarily arranged coaxially with respect to the generating axis and further setting the second spindle such that the axis of rotation of the face-mill cutter head is disposed at a distance to the generatrix in accordance with a desired spiral angle of the one gear;

performing a generating movement about the generating axis with the first spindle for producing the one gear, so that tooth spaces are cut-out by the face-mill cutter head;

removing the one gear from the first spindle; and

fabricating the mating gear of the gear pair with a desired spiral angle by performing a plunge-cut operation only.

4,611,957

DRILLING AND BORING FIXTURE FOR FURNITURE HARDWARE PARTS

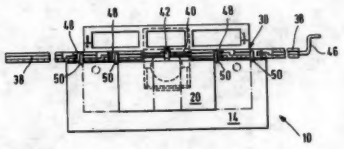
Karl Lautenschlager, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinhein, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,527

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338943

Int. Cl.⁴ B23Q *3/00*

U.S. Cl. 408—108 **8 Claims**



1. A fixture for adjustably mounting a board-like furniture part on a machine having a work table and a drill unit having at least one rotatably driveable tool for making holes or recesses in a flat surface of the furniture part, said unit being arranged in vertically spaced relationship above the upper surface of said work table and vertically movable such that the at least one tool may be lowered onto a furniture part supported on said work table, said fixture comprising: two stop rails mounted at a longitudinal edge of the work table in alignment with each other, and slightly above the upper surface of the work table to form a back stop for the furniture part; means for longitudinally displacing said stop rails equidistantly on opposite sides of a vertical plane centrally through the drill unit at right angles to the longitudinal edge; said displacing means including a threaded spindle having a central section to be mounted longitudinally non-displaceably, but rotatably, relative to said work table; said spindle having sections connected to said central section on opposite sides thereof; with threads of opposite and equal pitch and respectively threadedly engaging said two stop rails; at least one cursor disposed on each top rail for longitudinal displacement with respect thereto; means for fixing said cursors on the respective stop rail at uniform given distances; a stop on each cursor; and means for biasing each stop toward a position protruding over the work table upper surface, each stop being retractable into the respective cursor against said biasing means.

4,611,958

BORING HEAD

Georgy A. Vasilchenko, ulitsa Khersonskaya, 1, kv. 103, Moscow, U.S.S.R.

Filed Aug. 9, 1984, Ser. No. 638,999

Int. Cl.⁴ B23B *51/00, 3/26*

U.S. Cl. 408—168 **2 Claims**

1. A boring head of a multiple-operation machine tool comprising:

(a) a rotatable housing;

(b) a means for rotating said housing;

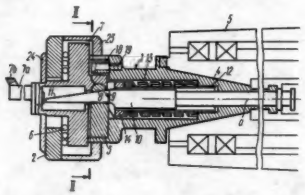
(c) a carriage having first and second ends, said first end having at least two slanted surfaces positioned in an oblique plane relative to an axis of rotation of said rotatable housing, said carriage mounted on bearings in one end of said housing and rotating in a similar direction as said rotatable housing;

(d) a cutting tool mounted in a mandrel of said carriage and attached by one end to said second end of said carriage;

(e) a substantially cylindrical finger element having at least one slanted surface and said finger element being positioned in said first end of said carriage;

(f) a rod coaxially positioned in said rotatable housing and having a slanted surface interacting with said slanted surface of said finger element of said carriage, wherein as said rod is turned said carriage is caused to turn in said similar direction as said rotatable housing and said cutting tool mounted in said carriage mandrel is caused to rotate in the same direction;

(g) a fork encircled by a spring and coaxially positioned in said rotatable housing near said rod in such a manner, whereby as said rod rotates in one direction said spring is caused to move said fork in an opposite direction;



(h) at least one pair of main rollers mounted on a first end of said fork and interacting with said slanted surfaces on said first end of said carriage, said main rollers having axles attached on one end of said rod and extending in a perpendicular plane relative to said axis of rotation of said rotatable housing;

(i) a rocker positioned between said pair of main rollers and said housing near said first end of said fork, and having an axle secured in said housing on a side of said housing facing said slanted surfaces of said carriage, said axle being parallel with said axis of rotation of said housing; and

(j) at least one pair of auxiliary rollers mounted on said first end of said fork between said main rollers and said rocker, said auxiliary rollers having axles parallel with said axles of said main rollers and attached to said fork in a plane extending through a line of contact between said main rollers and said slanted surfaces of said carriage rollers, said auxiliary rollers moving in a similar direction with said fork and preventing movement of said fork as said auxiliary rollers but against said rocker.

4,611,959

REAMER WITH RADIALLY ADJUSTABLE TOOL BIT POSITION

Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to MAPAL Fabrik für Präzisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany

Continuation of Ser. No. 458,903, Jan. 18, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 736,102

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201508

Int. Cl.⁴ B23D *77/02*

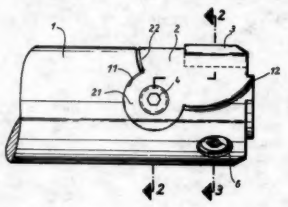
U.S. Cl. 408—180 **7 Claims**

1. In a reamer having a shaft defining a longitudinal axis, a cutter head mounted on said shaft, and a tool bit;

a clamping shoe for clamping said tool bit to said cutter head, a first and a second peripheral region each shaped as arcs of a circle, and a disk-shaped extension extending in the direction of the longitudinal axis of said shaft between said arcs, said disc-shaped extension having a periphery defining an at least semi-circular arc;

attachment means for attaching said clamping shoe to said cutter head,

adjusting means abutting said clamping shoe in an axial region of said cutter head for pivoting said clamping shoe



about an axis of rotation within a limited angle, being substantially free of any play, and for applying an adjustment force to said clamping shoe in a direction transverse to said axis of rotation, whereby, due to said adjusting means being substantially free of said play, said limited angle is kept relatively small, resulting in a substantially exact guidance of said clamping shoe in said cutter head.

4,611,960

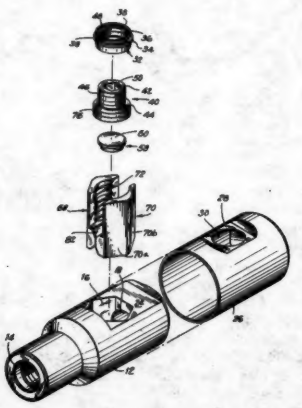
TOOL HOLDER

Raymond N. Quenneville, Suffield; Harry H. Mayne, and Kenneth H. Sickler, both of Simsbury, all of Conn., assignors to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Jan. 25, 1985, Ser. No. 694,965

Int. Cl.⁴ B23B *31/10*

U.S. Cl. 409—234 **22 Claims**



1. A tool holder comprising a substantially cylindrical body portion having an axial bore formed therethrough and mounting means formed at one end thereof, ways formed through said body in a direction transverse to said axial bore, the axis of said ways located normal to the axis of said body and intersecting the axis of said body, a pair of separate but mating anvil pieces having exterior surfaces formed to slidingly engage respective internal surfaces of said ways and gripping surfaces disposed at an angle α to a plane parallel to said axis of said body and normal to the axis of said ways, said angle α being an angle in the range of 15° to 75°, said pair of mating anvil pieces having formed thereon internal threads of a first pitch, a differ-

ential screw element having at one end external threads of a first pitch for engagement with said internal threads on said pair of mating anvil pieces, said differential screw element having formed on the opposite end thereof and coaxial with said external threads of a first pitch external threads of a second pitch, nut means adjustably fixed relative to said body means and having formed therein internal threads of a second pitch for engagement with said external threads of a second pitch formed on said differential screw element, said differential screw element having jaw face means formed on said one end, said threads of a first and second pitch and said angle α being related by the formula:

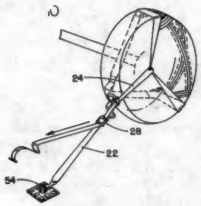
$$\frac{\text{First Pitch}}{\text{Second Pitch}} = \frac{1}{\text{Cos } \alpha} + 1$$

4,611,961

WHEEL HARNESS AND A METHOD FOR MOUNTING A WHEEL HARNESS ON A WHEEL

Willem H. P. Van Iperen, Westfield, N.J., and Thomas M. Cowhey, Bayside, N.Y., assignors to Sea-Land Corporation, Elizabeth, N.J.

Filed May 10, 1985, Ser. No. 733,135
Int. Cl.[4] B60P *3/07*; B65D *63/00*
U.S. Cl. 410—20 **20 Claims**



8. A method for mounting a wheel harness on a vehicle wheel, the harness comprising loop, hook and lashing straps connected together at a common strap junction, and a connecting section extending between and connecting together the hook and loop straps, the vehicle wheel including opposite, first and second vertically extending surfaces, the method comprising the steps of:

locating the common strap junction adjacent an outside face of the wheel;

placing the connecting section on the first vertically extending surface of the wheel;

wrapping the hook strap across the first vertically extending surface of the wheel and along an inside face thereof;

wrapping the loop strap over a top surface of the wheel and along the inside face thereof;

slipping the hook strap through a loop on the loop strap;

pulling the hook strap across the second vertically extending surface of the wheel;

wrapping the hook strap around the lashing strap; and

connecting the hook strap to the loop strap.

16. A wheel harness for securing a vehicle wheel to a support structure comprising;

a lashing strap for connecting the wheel harness to the support structure;

a band having a mid portion connected to the lashing strap and further having first and second sections extending therefrom; and

tire engaging means connected to and extending between the first and second sections of the band to engage a surface of the vehicle wheel;

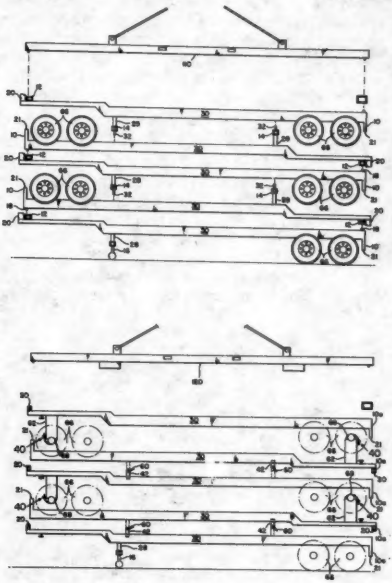
the first section of the band including at least one means adjacent an end thereof for receiving an end of the second section of the band to thereby form an apex of an angle located adjacent an outer circumference of the wheel to be secured, with the second section adapted to secured the apex thus formed to the lashing strap at the wheel's outer circumference.

4,611,962

CONTAINER CHASSIS BUNDLING SYSTEM

John L. Braly, 3826 231st SE., Issaquah, Wash. 98024, and Randall W. Matthewson, 2239 32nd Ave., Longview, Wash. 98632

Filed Mar. 22, 1984, Ser. No. 592,461
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—57 **9 Claims**



1. A wheeled truck chassis for use with containers, the chassis having mechanisms for stacking a similar second chassis on the first, wherein the chassis is of the type having two spaced apart, longitudinally extending rails between the wheels wherein the front ends of the rails are connected by a transversely extending front bolster and the rear end of the rails are connected by a transversely extending rear bolster, the rear bolster having two upwardly extending twist-lock bayonets for the attachment of a container thereto and wherein the chassis also has at least one axle for the wheels wherein the axle is positioned between the bolsters and below the rails wherein the chassis also has a landing gear cross brace below the rails and between the front bolster and the axle, the mechanisms comprising:

two permanently attached twist-lock bayonet receivers on the front bolster for receiving the rear bayonets of the second chassis so that the rear bayonets of the first and second chassis are receivable in the bayonet receivers on the front bolsters when the chassis are stacked in a reversed, inverted relationship;

two sliding rail clamps permanently and slidably attached to the landing gear cross brace to adjust to the width of the rails on the second chassis and having means for receiving and fixing the rails of the second chassis in the sliding rail clamps and to the first chassis.

4. A wheeled truck chassis for use with containers, the chassis having mechanisms for stacking a second chassis on the first, wherein the chassis are the type having two spaced apart, longitudinally extending rails wherein the front ends of the rails are connected by a transversely extending front bolster and the rear end of the rails are connected by a transversely extending rear bolster and wherein the chassis also has at least one axle for the wheels positioned between the bolsters and below the rails, a landing gear cross brace between the front bolster and the axle and a downwardly extending kingpin at the forward end of the chassis, the mechanisms comprising:

a removable axle saddle having means for releasably receiving a kingpin at one end and means for releasably receiving an axle at the opposite end for holding the axles of each chassis in a space relationship to the kingpins of each chassis when the chassis are stacked in a reversed, inverted relationship; and

two fixed rail clamps each pivotally attached to one of each of the rails so as to be pivotally positionable between a first extended position for grasping the rails of the second chassis and second stored position.

4,611,963

EXPANSION DOWEL WITH AN EXPANSION WEDGE AND AN ANNULAR EXPANSION MEMBER

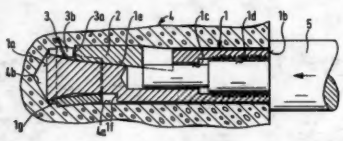
Peter Fröhlich, Neuried, and Armin Herb, Peissenberg, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Apr. 11, 1985, Ser. No. 722,158

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413854

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—54 **9 Claims**



1. An expansion dowel comprising an axially elongated dowel member having a leading end and a trailing end spaced apart in the axial direction with the leading end facing in the insertion direction in which said dowel member is inserted into a borehole or the like in a receiving material, the insertion direction corresponds to the axial direction extending from the trailing end to the leading end of said dowel member, said dowel member being sleeve-shaped for at least a part of the axial length thereof from the trailing end toward the leading end with the sleeve-shaped part forming an axially extending bore, the radially outside surface of said dowel member is generally cylindrically shaped from the trailing end thereof toward the leading end, a wedge-shaped recess is formed in the outside surface of said dowel member extending from the leading end to a point intermediate the leading end and the trailing end, said recess having a depth decreasing to the leading end of said dowel member, at the end of said recess adjacent the point intermediate the leading end and trailing end said recess opens into the bore formed by said sleeve-shaped part, an expansion wedge positioned within said recess and having a leading end and a trailing end spaced apart in the axial direction of said dowel member and said wedge being displaceable through said recess in the axial direction toward the leading end of said dowel member, said wedge having a radially inner surface and a radially outer surface with the radially inner surface in contact with the base of said recess radially inwardly from the cylindrically shaped outside surface of the dowel member and projecting into the bore formed in said dowel member wherein the improvement comprises that said dowel member has an annular groove encircling the axis thereof from the leading end toward the point intermediate the leading end and trailing end with at least an axially extending part of said annular groove from the leading end thereof increasing in depth, an expansion member encircling said dowel member in the axially extending region of said annular groove and having a stop shoulder extending transversely of the axial direction of said dowel member and positioned in the path of said expansion wedge and arranged to be contacted by the leading end of said expansion wedge as said wedge is displaced toward the leading end of said dowel member.

4,611,964

ANCHOR NAIL FASTENER

Seymour N. Schlein, 312H Country Club Dr., Americus, Ga. 31709

Filed Feb. 1, 1985, Ser. No. 697,496

Int. Cl.[4] F16B *15/00*

U.S. Cl. 411—356 **3 Claims**

1. In an anchor nail fastener having a tubular body member provided at one end with a head and pointed at the other end and with a side opening aperture with an internal ramp adjacent the pointed end from which an insert nail may curl as it is driven down through the tubular member, the improvement which comprises:

a dimple-like identation in the wall of the tubular body member spaced between the side opening aperture and the head and disposed on that side of the tubular member opposite the aperture and operable to engage a nail insert and deform the same between it and the internal ramp at the aperture to prevent pop-back of the nail insert.

4,611,965

GRAVITY-FEED GRAIN SPREADER

Carl R. Dixon, Rte. 2, Box 24A, Weiner, and Jackie R. Anschultz, Box 213, Fisher, both of Ark. 72427

Filed Jun. 29, 1984, Ser. No. 626,541

Int. Cl.[4] B65G *65/32*

U.S. Cl. 414—299 **7 Claims**

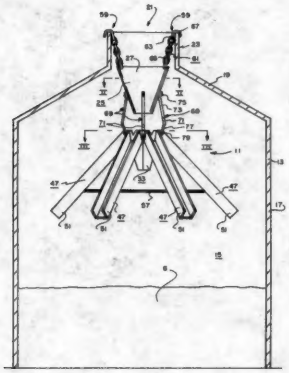
1. A gravity-feed grain spreader for use with a grain bin including roof structure having an inlet opening for allowing grain to be introduced into the interior of the grain bin, said grain spreader comprising:

(a) a first hopper means positioned beneath the inlet opening in the roof structure of the grain bin for initially receiving grain being introduced into the interior of the grain bin through the inlet opening; said first hopper means including a funnel member having a relatively large inlet opening and a relatively small outlet opening;

(b) a second hopper means positioned beneath said first hopper means for receiving grain from said first hopper means; said second hopper means including a funnel member having an upper end with a relatively large inlet opening therein and having a relatively small outlet opening;

(c) a plurality of channel means attached to said upper end of said funnel member of said second hopper means for receiving grain from said second hopper means after the

grain substantially fills said funnel member of said second hopper means and starts to overflow into said channel means and for directing the grain received from said second hopper means outward from said second hopper means, each of said channel means extending outwardly and downwardly from said funnel member of said second hopper means;



(d) a first attachment means attaching said funnel member of said first hopper means relative to the roof structure of the grain bin; and

(e) a second attachment means attaching said funnel member of said second hopper means relative to said funnel member of said first hopper means.

4,611,966

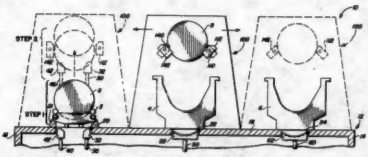
APPARATUS FOR TRANSFERRING SEMICONDUCTOR WAFERS

Lester R. Johnson, 411 Fourth St., Radford, Va. 24141

Filed May 30, 1984, Ser. No. 615,288

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—404 **16 Claims**



1. Wafer transfer apparatus, comprising, in combination:

table means for providing support and having a first station and a second station;

head means movable on the table means from the first station to the second station;

means for moving the head means on the table means;

first lifting means at the first station for raising wafers to be transferred, including a first plurality of wafers and a second plurality of wafers;

second lifting means at the second station for receiving transferred wafers and for lowering the transferred wafers; and

roller means secured to the head means, including a first roller and a second roller, each of which includes a plurality of slots, and the first and second rollers are rotatable to a plurality of positions, including

a first position in which the spacing between the slots of the first and second rollers is sufficient to allow the wafers to move between the rollers as the wafers are lifted by the first lifting means,

a second position in which the rollers receive and hold the wafers lifted by the first lifting means for transporting the wafers from the first station to the second station, and

a third position in which spacing between some of the slots of the first and second rollers is sufficient to allow the second plurality of wafers held by the rollers to move downwardly to be received by the second lifting means while the spacing between the remaining slots is sufficient to continue holding the first plurality of wafers by the rollers.

4,611,967

CASSETTE-TYPE CONTAINER FOR A SHEET-LIKE MEMBER

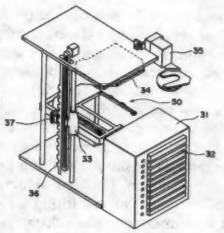
Shinji Tsutsui, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,282

Claims priority, application Japan, Jul. 6, 1984, 59-140197; Jun. 5, 1985, 60-122182

Int. Cl.[4] B65D *85/30;* **G03B** *9/02, 41/16*

U.S. Cl. 414—411 **2 Claims**



1. An automatic feeding system for a sheet-like member, comprising:

a cassette-type container for containing the sheet-like member,

wherein said container includes a lower member for carrying the sheet-like member, said lower member having a side wall and an extension formed on said side wall, an upper member engageable with said lower member to define a closed chamber, said upper member having a side wall and an extension formed thereon, a guide channel formed in the side wall of said upper member, for guiding rectilinear movement of said upper member when it is engaged by or disengaged from said lower member, a guide pin formed on the side wall of said lower member, said guide pin being engageable with said guide channel of said upper member so that said upper member is pivotally movable about said guide pin when the latter is at an innermost position in said guide channel, and means for holding said upper member and lower member against separation, said holding means including an engaging element formed on said upper member and another engaging element formed on said lower member and engageable with said engaging member of said upper member;

means for holding said extension formed on the side wall of said upper member;

means for applying a biasing force to said extension holding means to urge said extension holding means in a direction rotating it about said guide pin;

fork means adapted to carry thereon said extension formed on the side wall of said lower member, to separate said lower member from said upper member and to feed said lower member; and

elevator means for moving said fork means in a direction perpendicular to the direction of the rectilinear movement

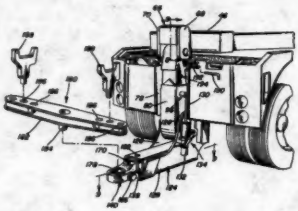
of said lower member, to disengage said lower member from said upper member.

4,611,968

LIFTING AND TOWING APPARATUS FOR LARGE VEHICLES

Frankie E. Casteel, Soddy Daisy, Tenn., assignor to Dover Corporation, Chattanooga, Tenn.

Filed Dec. 24, 1984, Ser. No. 685,463
Int. Cl.[4] B60P 3/12
U.S. Cl. 414—563 **19 Claims**



1. Apparatus adapted to be mounted on the rear of a towing vehicle for lifting and towing a disabled vehicle, said apparatus comprising support means adapted to be secured to the towing vehicle, said support means including a pair of spaced rails having respective substantially vertically extending slideways, an elevator, a slide block slidably disposed within each slideway, means for fastening said slide blocks to said elevator so that said elevator may move vertically relative to said slideway to various elevational positions, a lifting boom having a free end adapted for attaching disabled vehicle engaging means, journal means for mounting said lifting boom on said elevator for pivotable movement about a substantially horizontal axis from an upright storage position to a rearwardly extending operative position, extendible beam means adapted to be pivotably mounted on said towing vehicle about a substantially horizontal pivot axis, elevation control means for selectively raising and lowering said extendible beam means relative to said towing vehicle, attitude control means for selectively extending and retracting said extendible beam means relative to said pivot axis, connecting means for pivotably mounting said elevator on said extendible beam means for raising and lowering said elevator in response to said elevational control means and for pivoting said elevator in response to said attitude control means independently of the elevational position of the elevator, and means for selectively pivoting said lifting boom relative to said elevator between said storage position and said operative position.

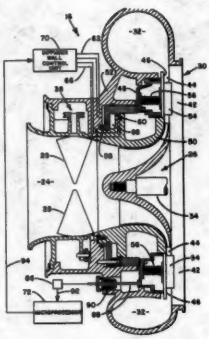
4,611,969

CALIBRATING APPARATUS AND METHOD FOR A MOVABLE DIFFUSER WALL IN A CENTRIFUGAL COMPRESSOR

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,457
Int. Cl.[4] F04D 17/10, 29/46
U.S. Cl. 415—1 **12 Claims**

1. In a method of controlling a centrifugal compressor in a refrigeration system that includes the steps of:
providing a diffuser section in the compressor having a movable wall for varying of the width of the diffuser section,
measuring predetermined system parameters,
defining an optimum position of the movable wall at the measured system parameters, and
moving the wall to the optimum position,
the improvement comprising the steps of:
providing a programmable device for controlling movement of the wall,
determining when the position of the movable wall is unknown,



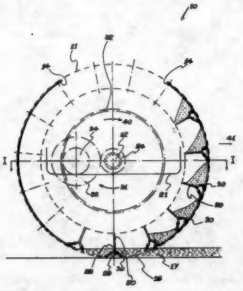
causing the programmable device to move the wall to a known reference position, and
calibrating the programmable device with the known position of the wall at the reference position.

4,611,970

APPARATUS FOR REMOVING WATER FROM THE GROUND

Hugh R. McLaughlin, Aberdour, Bray Road, Foxrock, Dublin 18, Ireland

Filed May 29, 1985, Ser. No. 738,730
Claims priority, application Ireland, May 30, 1984, 1363/84
Int. Cl.[4] F04D 23/00
U.S. Cl. 415—6 **8 Claims**



1. An apparatus for the removal of water from the ground, including a ground engaging drum comprising an outer hollow cylinder mounted for rotation about a horizontal axis, a plurality of apertures distributed around the circumference of the outer cylinder, a non-rotating part cylindrical member concentric with and mounted immediately inside the outer cylinder, the part cylindrical member being open in the region of ground contact of the drum to permit receipt of ground water through the apertures in the outer cylinder, a plurality of elements disposed within the outer cylinder and mounted for rotation concentric therewith, means for effecting rotation of the said plurality of elements relative to the outer cylinder during rotation of the latter, the said elements engaging the inside

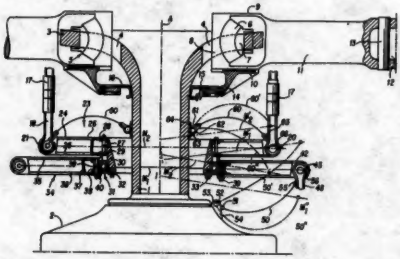
surface of the outer cylinder and the part cylindrical member in such manner as to sweep ground water received through the apertures upwardly away from the ground for trapping between the said elements and the part cylindrical member, and a non-rotating water tank mounted within the outer cylinder into which water swept upwards by the said elements is discharged at a certain height.

4,611,971

DEVICE COMPRISING CYCLIC PLATES DRIVEN BY FLEXIBLE BLADES, FOR CONTROLLING A HELICOPTER ROTOR

Jacques A. Aubry, Cabries, and Michel R. Bonfils, Saint-Cannat, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Sep. 23, 1985, Ser. No. 779,341
Claims priority, application France, Sep. 26, 1984, 84 14787
Int. Cl.[4] B64C *27/605*
U.S. Cl. 416—114 **16 Claims**



1. In a device comprising cyclic plates for controlling the angle of attack of the blades of a helicopter lift rotor which is integral with a rotor shaft and driven in rotation by this latter about an axis of rotation of the rotor, the device comprising:

two cyclic plates disposed about the rotor shaft and one of which is a rotary plate driven in rotation with the rotor shaft and mounted for rotation by means of at least one ball bearing on the other non rotary plate secured against rotation about the axis of the rotor,

a mechanism for guiding the non rotary plate in axial translation and angular movement with respect to the rotor shaft, and

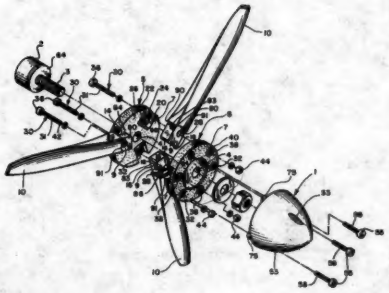
a mechanism for driving the rotary plate in rotation and securing the non rotary plate against rotation, comprising at least one member pivotably mounted on the one hand to the rotary plate and on the other to the rotor shaft and at least one member pivotably mounted on the one hand to the non rotary plate and on the other to a structural element of the helicopter, the rotary plate following all the movements of the non rotary plate, driven by pilot controls and transmitting them to levers controlling the angle of attack of the rotor blades through pitch control links, the whole of said two mechanisms is formed by two sets of flexible blades which each extends substantially radially with respect to the axis of the rotor and each of which is curved in a plane passing through said axis of the rotor while presenting its concave side towards said plates, a first set of blades comprising at least one blade having a transverse stiffness which allows it, on the one hand, to drive the rotary plate in rotation on which each of the blades of the first set is pivotably mounted by its external radial end, whereas its internal radial end is pivotably mounted to the rotor shaft at a fixed point thereon situated above said rotary plate and, on the other hand, to ensure centering of said plates with respect to the rotor shaft, each blade of said first set also having a longitudinal flexibility which, associated with the rotation of its pivotably mounted ends, allows it to follow the translational and tilting movements which are imparted to the blades by said pilot controls, and said second set of blades comprising at least one blade having, on the one hand, a transverse stiffness which allows it to hold said non rotary plate against rotation, on which each blade of the second set is pivotably mounted by its external radial end, whereas its internal radial end is pivotably mounted to the structural element of the helicopter at a fixed point thereon situated under the non rotary plate and, on the other hand, a longitudinal flexibility which, associated with the rotation of its pivotably mounted ends, allows it to follow the translational and tilting movements which are imparted to the non rotary plate by said pilot controls.

4,611,972

AEROPLANE PROPELLER

Ralph Andrae, 15 Morgan St., Crystal Lake, Ill. 60014

Filed May 31, 1984, Ser. No. 615,566
Int. Cl.[4] B64C *11/06*
U.S. Cl. 416—214 R **6 Claims**



1. A propeller assembly comprising a pair of complementary front and rear hub members having opposing pockets with rough textured grasping surfaces therein,

propeller blades made of wood material having root end portions with initially plain faces fitted into said pockets,

means securing said hub members to each other and to said blades at said root end portions in compressing relation thereto,

said hub members being made of plastic material with multidirectionally oriented non-plastic fibers interspersed therein bulged outwardly from said grasping surfaces, and

said fibers being impressed into and indenting the plain faces of the wood material at the root end portions for obtaining a firm purchase thereon attendant to said hub members being clamped about said root end portions.

4,611,973

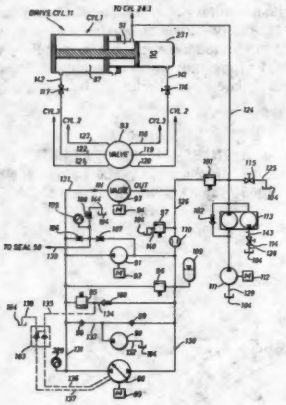
PUMPING SYSTEM AND METHOD OF OPERATING THE SAME

J. C. Birdwell, Houston, Tex., assignor to P & B Industries, Houston, Tex.

Continuation-in-part of Ser. No. 220,527, Dec. 29, 1980, abandoned, and a continuation-in-part of Ser. No. 309,979, Oct. 8, 1981, abandoned, and a continuation-in-part of Ser. No. 348,497, Feb. 11, 1983, abandoned, and a continuation-in-part of Ser. No. 455,509, Jan. 4, 1983, Pat. No. 4,541,779. This application Sep. 6, 1983, Ser. No. 529,487
Int. Cl.[4] F04B *9/10*
U.S. Cl. 417—342 **16 Claims**

1. A method of pumping fluid comprising the steps of connecting the discharge lines of at least four piston pumps to a common discharge line, reciprocating the piston of each said pump in a closed chamber having inlet and outlet valves that allow fluid to be moved into position in the chamber to be

pumped when the piston is moved in one direction on its suction stroke and to discharge fluid when the piston is moved in the other direction on its power stroke, said method comprising supplying first and second expansible chambers of each pump during successive overlapping time intervals with fluid under pressure to reciprocate the plungers on their power and



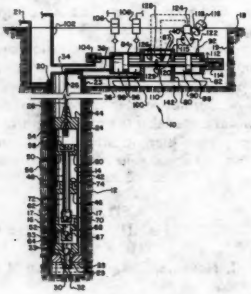
suction strokes, and connecting third chambers of the pumps in a closed loop containing fluid that when displaced from the third chambers of pumps having the pistons on their power stroke will flow to the third chamber of one or more pumps whose piston is on its suction stroke to keep at least one piston moving on its power stroke at all times.

4,611,974

HYDRAULICALLY OPERATED WELL PUMP SYSTEM

John H. Holland, 2706 Walnut Rd., Norman, Okla. 73069

Filed May 30, 1984, Ser. No. 615,300
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—388 **30 Claims**



1. A hydraulically operated fluid pumping apparatus for a downhole well pump comprising:

a frame;

first and second opposed cylinder means mounted on said frame, each of said cylinder means including a cylinder bore, first and second piston means disposed in respective ones of said bores and dividing said bores into opposed fluid chamber, respectively, said first and second piston means being interconnected by a common piston rod mounted for reciprocation of said frame, wherein one of said chambers formed by said one bore is connected to a gas delivery conduit for connection to a wellbore for evacuating gas from said wellbore in response to reciprocation of said piston means;

a production fluid delivery conduit for delivering production fluid to one of said chambers formed by one of said bores of one of said cylinder means and a production fluid discharge conduit connected to said one chamber for receiving production fluid from said apparatus; and

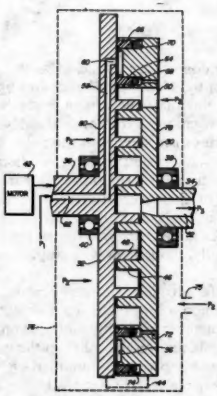
hydraulic pump means operably connected to opposed hydraulic fluid chambers of the other of said cylinder means for delivering hydraulic fluid to reciprocate said piston means through said hydraulic fluid chambers, respectively, and control means responsive to movement of said piston means to effect flow reversal of fluid from said hydraulic pump means to alternately deliver pressure fluid to said hydraulic fluid chambers to effect reciprocation of said piston means for delivering production fluid to said discharge conduit and said delivery conduit, respectively.

4,611,975

SCROLL TYPE COMPRESSOR OR PUMP WITH AXIAL PRESSURE BALANCING

Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 11, 1985, Ser. No. 774,707
Int. Cl.[4] F01C *1/04, 11/00*
U.S. Cl. 418—5 **9 Claims**



1. A scroll type compressor or pump comprising:

first and second scrolls each having at least one generally spiral vane;

said scrolls having their vanes interfitted to define an interface and having pressure responsive surfaces oppositely of said interface;

a radially outer inlet to said interface;

a radially inner outlet from said interface;

a bearing mounting at least one of said scrolls;

means interconnecting said scrolls so that one scroll will orbit relative to the other so that said vanes define closed pockets at said interface which travel from said inlet to said outlet;

means for orbiting said one scroll; and

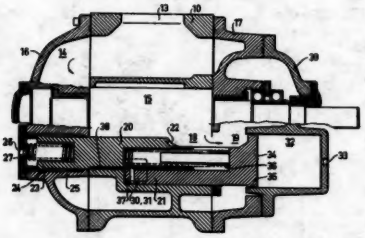
means including a chamber at said interface and isolated from said vanes, said pockets, said inlet and said outlet, for creating a low pressure zone whose pressure in less than the pressure at said inlet.

4,611,976

CAPACITY AND INTERNAL COMPRESSION CONTROL DEVICE IN A SCREW COMPRESSOR

(Lars) Laurtiz B. Schibbye, Saltsjö-Duvnäs, and Rolf A. Englund, Spanga, both of Sweden, assignors to Sullair Technology AB, Sweden

Filed Apr. 29, 1983, Ser. No. 489,789
Claims priority, application Sweden, Apr. 30, 1982, 8202735
Int. Cl.[4] F01C 18/00
U.S. Cl. 418—159 6 Claims



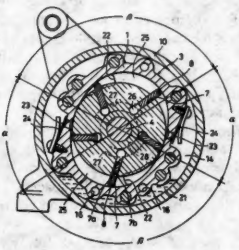
1. A device for controlling an oil injected screw compressor, in which a rotor housing having an inlet end and a discharge side includes a compression space with two intermeshing rotors and in parallel with the rotors along the discharge side of the rotor housing two axially movable sliding valves, viz. one inner and one outer sliding valve and is arranged for controlling the internal compression in the compression space, and the outer sliding valve is arranged for controlling the capacity of the compressor, characterized in that a cylinder is positioned in the housing inlet end and has a piston on one end of the inner sliding valve slidably received therein, said cylinder being connected to an oil supply at a pressure substantially equal to pressure at the compressor discharge side to actuate the piston on its side remote from the compression space, and said outer sliding valve being actuated by a compression spring for moving the outer sliding valve to its entirely unloaded position when the compressor is not in operation, said compression spring having one end on the outer sliding valve and the other end on the inner sliding valve.

4,611,977

VANE COMPRESSOR WITH VANE BACK PRESSURE ADJUSTMENT

Tsunenori Shibuya; Yutaka Ishizuka; Haruhiko Takada; Teruo Nakamura, and Hidehiko Takayama, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 502,666, Jun. 19, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 640,312
Claims priority, application Japan, Jun. 18, 1982, 57-91163[U]
Int. Cl.[4] F04C 18/00
U.S. Cl. 418—76 5 Claims



1. A vane compressor comprising:

(a) a compressor body composed of a cylinder having at least one pump outlet and opposite axial ends, and a pair of side blocks secured to said axial ends of said cylinder and having opposite inner end surfaces;

(b) a rotor rotatably mounted in said compressor body and having opposite end surfaces facing said inner end surfaces of said side blocks, said rotor carrying a plurality of vanes slidably fitted therein, said rotor having a plurality of back-pressure chambers defined therein and surrounded by said vanes and said side blocks, said back-pressure chambers each having opposite axial ends opening in said opposite end surfaces of said rotor;

(c) an oil sump;

(d) said opposite axial ends of each said back-pressure chambers being disposed to follow a path against each of said opposite inner end surfaces of said side blocks, said path being divided into at least one high-pressure zone in which said vanes move across said pump outlet, and at least one normal-pressure zone;

(e) said opposite inner end surface of said side blocks each having at least one oil groove defined therein and disposed to communicate with said back-pressure chambers, said at least one oil groove being located in said at least one high-pressure zone;

(f) means for feeding oil from said oil sump to said oil grooves; and

(g) restrictor means provided in said high-pressure zone of said path and communicating with said back-pressure chambers, said restrictor means comprising clearances between said side blocks and said rotor, and restriction passages defined in said side blocks and having one end of each restriction passage communicating with said clearances and an opposite end of each restriction passage communicating with said oil sump, said one end of each of said restriction passages opening into said clearances at locations radially outward of said oil grooves;

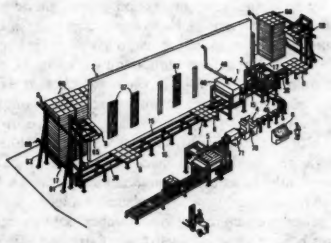
(h) wherein while said axial ends of each said back-pressure chambers are following said normal-pressure zone as said rotor rotates, said oil grooves are in communication with said back-pressure chambers to introduce oil in said oil grooves into said back-pressure chambers, and while said axial ends are following said high-pressure zone, said back-pressure chambers are out of communication with said oil grooves, whereby the oil in said back-pressure chambers is confined therein while being compressed therein, except that a fraction of the oil is leaked through said restrictor means.

4,611,978

PRODUCTION LINE FOR BITUMEN CAKES

Cesare Sangiorgi, Via Morganti 4, Ravenna, Italy

Continuation-in-part of Ser. No. 467,006, Feb. 16, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,863
Claims priority, application Italy, Feb. 26, 1982, 84911 A/82
Int. Cl.[4] B29C 33/44
U.S. Cl. 425—73 6 Claims



1. A production line for oxidized bitumen cakes including a multiplicity of supporting frames each having a plurality of

receptacles arranged to removably accomodate and carry a respective mold;

a plurality of metal molds each comprising a relatively shallow pan or basin having a resiliently deformable bottom integral with uniterrupted side wall or walls;

a guide and handling system arranged to sequentially move the supporting frames throughout the plant;

a casting station whereat not liquid bitumen is sequentilly cast in at least one metal mold being carried on a supporting frame;

a cooling station whereat supporting frames carrying molds containing liquid bitumen are stacked one on the other and bitumen cools to yield bitumen cakes; and

a shake-out station comprising an extraction apparatus having adjustable retaining means arranged to act at two diagonally opposite positions on each pan or basin for holding it or them in position in a respective receptacle in its or their supporting frame, and a pusher assembly arranged to act at a controllable rate on the outside of the bottom of each said pans or basins to produce resilient deformation of both the bottom and resilient twisting or torsion of the said pans or basins and cause the said pans or basins to become detached or separated from a respective bitumen cake formed therein.

4,611,979

PROCESS AND APPARATUS FOR EXTRUSION OF COMPOSITE STRUCTURAL MEMBERS

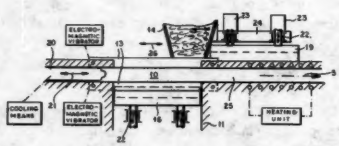
Anton Hegenstaller, Mühlenstrasse 9, D-8891 Unterbernbach, and Xaver Spies, Kühbach/Unterbernbach, both of Fed. Rep. of Germany, assignors to Anton Hegenstaller, Unterbernbach, Fed. Rep. of Germany

Division of Ser. No. 684,013, Dec. 20, 1984. This application Sep. 10, 1985, Ser. No. 764,846

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346469

Int. Cl.[4] B29C *47/54*

U.S. Cl. 425—376 R **11 Claims**



1. In an apparatus comprising a piston extruder press in which an extrudate product is formed in a compression chamber by a precompression of a mixture of vegetable bits and a binder, said mixture being precompressed in said compression chamber by an upper precompression piston movable down toward said extrusion axis and a lower precompression piston movable upward toward said extrusion axis, and said compression chamber being provided with an output channel, directed along the extrusion direction, through which said extrudate product is forced by an extruder piston from said compression chamber subsequent to compression, the improvement wherein a plurality of upright, substantially equal, thin-walled bars are arranged locally fixed spaced from each other along a first plane parallel to said extrusion axis above said compression chamber and along a second plane parallel to said extrusion axis below said compression chamber, said precompression pistons being movable toward said extrusion axis so as to engage among said bars limitedly and stopped at a plane corresponding to the contour of the extruder piston of said extrusion press said precompression pistons having recesses for receiving said bars.

4,611,980

FIBER REINFORCED THERMOSETTING RESIN CYLINDRICAL SHAPE PRODUCT MANUFACTURING APPARATUS

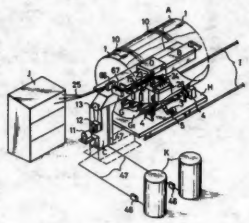
Shuya Tsuji; Yoshichika Kawabata, and Rokuro Yamamoto, all of Osaka, Japan, assignors to Dai Nihon Ink Kagaku Kogyo Kabushiki Kaisha, Tokyo and Yamamoto Kogyo Kabushiki Kaisha, Okayama, both of, Japan

Filed Aug. 22, 1983, Ser. No. 525,405

Claims priority, application Japan, Aug. 20, 1982, 47-144337; Oct. 20, 1982, 47-184083; Dec. 16, 1982, Japan, 47-219269

Int. Cl.[4] B29C *41/04*

U.S. Cl. 425—435 **11 Claims**



1. A fiber reinforced thermosetting resin cylindrical shaped product manufacturing apparatus comprising:

(a) a cylindrical forming die body having a longitudinal axis and open axial ends;

(b) first means for supporting and rotating said cylindrical forming die body about the longitudinal axis thereof at a rotational speed selected so as to cause a centrifugal force of less than two times the gravitational force at the periphery of a cylindrical product being manufactured;

(c) a cantilever beam body positionable within said cylindrical forming die body and extending along the longitudinal axis of said cylindrical forming die body;

(d) a suspension stand mounted on said cantilever beam body;

(e) second means mounted on said suspension stand for feeding strands of reinforcing fiber to the inner surface of said cylindrical forming die body as said cylindrical forming die body is being rotated by said first means;

(f) third means mounted on said suspension stand for coating the reinforcing fibers with a liquid thermosetting resin;

(g) fourth means mounted on said suspension stand for mixing a resin hardening agent into the liquid thermosetting resin;

(h) said second means, said third means, and said fourth means cooperating to form an unfinished, roughly cylindrical mass of reinforcing fibers coated with a liquid thermosetting resin mixed with a resin hardening agent on the inner surface of said cylindrical forming die body;

(i) a plurality of axially spaced, freely rotatable pressing rollers mounted on said suspension stand and sized, shaped, and positioned so as to bear against the inner surface of the roughly cylindrical masses produced by said second, third, and fourth means so as to complete the shaping of the inner surface of each cylindrical shaped product, each one of said plurality of axially spaced, freely rotatable pressing rollers being rotatably mounted on the distal end of a rocking lever which is pivotably mounted on said suspension stand; and

(j) fifth means for selectively, controllably, and independently adjusting the amount by which each one of said rocking levers is pivoted, whereby the position of the associated one of said plurality of axially spaced, freely rotatable pressing rollers can be selectively and controllably adjusted;

(k) each one of said plurality of axially spaced, freely rotatable pressing rollers being pivotably supported in a bearing body which, in turn, is freely pivotable on the distal end of the associated one of said rocking levers, whereby:

(i) each one of said plurality of axially spaced freely rotat-

able pressing rollers pivots freely relative to the distal end of the associated one of said rocking levers and

(ii) only the weight of each one of said plurality of axially spaced, freely rotatable pressing rollers and its associated bearing body bears against the inner surface of the roughly cylindrical masses produced by said second, third, and fourth means.

4,611,981

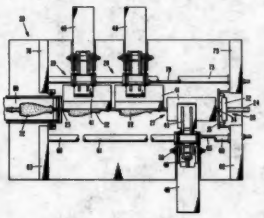
THREE-MOLD HAND-OVER-HAND BLOW MOLDING MACHINE

Larry W. English, Rte. 52 Box 386, Terre Haute, Ind. 47805

Division of Ser. No. 518,724, Jul. 29, 1983, abandoned. This application Aug. 27, 1985, Ser. No. 769,901

Int. Cl.[4] B29C *17/07*

U.S. Cl. 425—529 **1 Claim**



1. A hand-over-hand blow molding machine for forming along a longitudinal axis a chain of hollow, shaped article bodies of a normally highly crystalline thermoplastic material which is biaxially oriented, from a continuous tube of said material in substantially unoriented condition, but at its orientation temperature, in which machine said tube in the first phase of the cycle of operation of said machine is pulled from a front point to a back point on said axis, and in the second phase of said operation is pulled from said front point to an intermediate point on said axis between said front and back points, said machine comprising

(a) stationary tube clamp means to stop the travel of the tube past said front point during part of the time it is being pulled in each said phase, whereby in said first phase the portion of the tube between said front and back points becomes longitudinally stretched and in said second phase the portion of the tube between said front and intermediate points becomes longitudinally stretched;

(b) a first blow mold assembly on one side of said axis and comprising a first blow mold having a front end and a back end, and movable to and from a front position whereat its front end is in the region of the front point and a back position whereat its front end is substantially at said back point and the back end is at a back limit of mold travel, said mold having corresponding mold pieces closable on the stretched part of the tube between said front and intermediate points, and, after formation of a hollow body in the cavity defined by the closed mold pieces, operable to open positions whereat they are out of the path of travel of the closed mold pieces of the second and third blow molds hereinafter recited, tube inflation means for inflating the portion of the stretched part of the tube within the mold cavity, whereby one of said bodies is formed therein, and the material thereof becomes biaxially oriented, and mold opening and closing means for opening and closing said mold pieces to their open and closed positions;

(c) first prime mover means for moving longitudinally said first blow mold assembly and thus said first blow mold to and from its front and back positions;

(d) second and third blow mold assemblies on the other side of said axis and longitudinally connected together, said assemblies comprising adjacent, longitudinally aligned, second (front) and third (back) blow molds, said assemblies being movable longitudinally from and to front positions whereat the front end of the second mold is in the region of said front point, and back positions whereat the front end of the second mold is substantially at said intermediate point and the back end of the third mold is substantially at said back limit of mold travel, each of said molds having corresponding mold pieces closable on the stretched part of the tube between said first and third points and, after formation of the hollow body in each cavity defined by the closed mold pieces, openable to open positions whereat they are out of the path of travel of the closed mold pieces of the first blow mold, tube inflation means for inflating the portion of the stretched part of the tube within the mold cavity, whereby one of said bodies is formed therein, and the material thereof becomes biaxially oriented, and each of said second and third blow mold assemblies having mold opening and closing means for opening and closing the mold pieces of the blow molds thereof to their open and closed positions;

(e) second prime mover means for moving said second and third blow mold assemblies from and to their front and back positions; and

(f) control means operable to cause

(i) the mold opening and closing means of the first blow mold assembly to close the mold pieces of the first blow mold on the part of the tube between said front point and said intermediate point when the first blow mold is in its front position, and to maintain said mold pieces closed on said part of said tube while said first blow mold is being moved from its front position to its back position, and said tube is being pulled thereby to said back point, to open said mold pieces to their open position when said first blow mold is in its back position, and to maintain said mold pieces in said open positions while said blow mold is moved from its back position to its front position,

(ii) said mold opening and closing means of the second and third blow mold assemblies to close the mold pieces of the second and third blow molds on the portion of the tube between said front point and said back point when the second and third blow molds are in their front positions, to maintain said mold pieces closed on said part of the tube while said blow molds thereof are moved from their front positions to their second positions, and said tube is being pulled thereby to said intermediate point, to open to their open position said mold pieces when said second and third blow molds are in their second positions, and to keep said mold pieces in said open position while the second and third blow mold assemblies are moved from their back positions to their front positions,

(iii) the tube inflation means of the first blow mold to inflate the portion of the stretched part of the tube within the mold cavity of the first blow mold,

(iv) the tube inflation means of the second and third blow molds to inflate the portion of the stretched part of the tube within each mold cavity of the second and third blow molds,

(v) said first prime mover means to move said first blow mold assembly from its front position to its back position while said second and third blow mold assemblies are moved from their back positions to their front positions, and from their back positions to their front positions while said second and third blow mold assemblies are moved from their front positions to their back positions,

(vi) said second prime mover means to move said second and third blow mold assemblies from their back positions to their front positions, and from their front positions to their back positions, and

(vii) said stationary clamp means to close on said tube and stop its travel past the front point when the first blow mold assembly has moved a preselected proportion of

the distance between the front and back positions thereof, whereby the portion of the tube between said front and back points becomes longitudinally stretched, to open after the mold pieces of said second and third molds have closed on said longitudinally stretched portion of the tube, to close on said tube and stop its travel past the front point when the second and third blow mold assemblies have moved said proportion of the distance between said front and back positions thereof, whereby the portion of the tube between said front and intermediate points becomes longitudinally stretched, and to open after the mold pieces of said first blow mold have closed on the latter portion of the tube, whereby said portions of the tube are longitudinally stretched substantially to the same extent.

4,611,982

INJECTION-MOLDING SYSTEM FOR THE PROCESSING OF CASTING RESIN

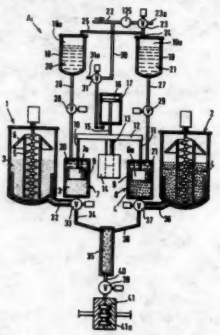
Erhard Hüeuser, Schoeffengrund, and Wilhelm Hedrich, Ehringshausen, both of Fed. Rep. of Germany, assignors to Wilhelm Hedrich Vacuumanlagen GmbH & Co. KG, Ortsteil Katzenfurt, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,935

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420222

Int. Cl.[4] B29C *45/53*

U.S. Cl. 425—543 **12 Claims**



1. In an injection-molding apparatus the improvement, comprising: at least one pump cylinder in which a piston is slidable, which piston divides the cylinder into a pump chamber and a drive chamber, means for introducing an unencased casting resin or casting resin component into said pump chamber at a first pressure, means for introducing a driving fluid compatible with said casting resin or casting resin component into said drive chamber at a second pressure similar to but somewhat exceeding said first pressure for driving said piston, gap means spacing said piston from the wall of said cylinder for preventing jamming of filler particles therebetween and resultant scoring of said piston and cylinder wall, said piston and cylinder wall being free of mechanical seals therebetween, said means for introducing a driving fluid comprising container means for said driving fluid connected to said drive chamber and means connected to said container means for pressurizing said driving fluid, active surfaces of the piston which contact with the driving fluid and the casting resin or the casting resin components being at least approximately of the same size.

4,611,983

INJECTION PRESS FOR USE IN A TRANSFER MOLDING SYSTEM

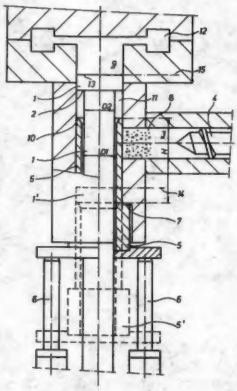
Friedrich B. Bielfeldt, Eppingen-Mühlbach, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH, Eppingen, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 657,562

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336080

Int. Cl.[4] B29C *45/02*

U.S. Cl. 425—544 **7 Claims**



1. An injection press for use in a transfer molding system for fiber reinforced, thermo-setting resins, comprising:

(a) an injection piston;

(b) an injection cylinder in which the injection piston moves;

(c) a feed bore traversing the injection cylinder;

(d) a sprue orifice leading into a mold;

(e) a telescoping sleeve sealing off the feed bore when the piston travels toward the sprue orifice, wherein the injection piston seals the sprue orifice upon completing a stroke near the sprue orifice, and wherein the feed bore is open when the piston is in a position a stroke length away from the sprue orifice.

4,611,984

TEMPERATURE COMPENSATOR FOR PRESSURE OPERATED FUEL REGULATOR

Ray L. Newman, Towanda; Hoffman, Theodore H., Laceyville; Raymond E. Dorazio, Wysox; John L. Ferri, Towanda; Jeffrey M. Gonzalez, Towanda, and William C. Fulkerson, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 5, 1985, Ser. No. 751,904

Int. Cl.[4] F23N *1/00*

U.S. Cl. 431—19 **3 Claims**

1. A multi-pass ceramic recuperator assembly comprising:

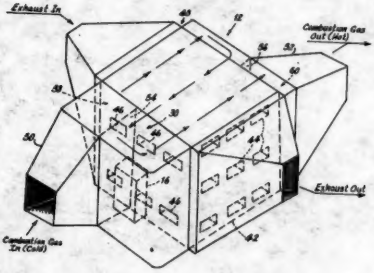
a recuperator body having a first set of passages for receiving and passing an exhaust gas;

a second set of passages, orthogonal to said first set, for receiving and passing a combustion gas;

a housing for said body, said housing having oppositely disposed inlet and outlet means for said combustion gas communicating with said second set of passages, said inlet and outlet means including baffles which divide said second set of passages into a serpentine path which includes an entrance segment, an intermediate segment, and an exit segment; and

a temperature compensator mounted within the gaseous flow of said intermediate segment, said temperature compensator comprising: a compensator housing having a

gaseous intake communicating with said gaseous flow and a gaseous outtake connected to a fluid line extending out of said recuperator housing; a chamber connecting said intake and said outtake; and a bleed valve communicating with said chamber and with a fluid line extending out of



said recuperator housing, said bleed valve being actuable to open and close in response to a temperature sensitive mechanism; said temperature sensitive mechanism being mounted exteriorly of said compensator housing and directly in the path of said gaseous flow from said intermediate segment.

4,611,985

VAPORIZATION BURNER

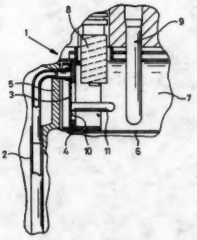
Karl Panick, Planegg, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,848

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403972

Int. Cl.⁴ F23D *11/44*

U.S. Cl. 431—240 **20 Claims**



1. A pilotless vaporization burner for a heating device operated with liquid fuel, especially oil, such as a heating device for a vehicle, of the type having a combustion chamber in which a glow type ignitor and a carrier are disposed, the carrier being connected with a fuel line and supporting an absorbent body on a surface thereof, wherein a heat conducting body projects from the surface of the carrier, past the ignitor in heat exchange relationship thereto, into a flame zone of the combustion chamber, said heat conducting body being made of a heat conductive material that is capable of withstanding the heat of the flame zone, said conductive body being operative for conducting heat from said glow type ignitor to said carrier so as to rapidly bring said surface thereof to a fuel vaporization temperature during an ignition operation, said conductive body also being operative for conducting heat from the burner flame to said carrier for continuous vaporization of said fuel during combustion.

4,611,986

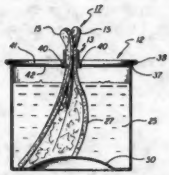
DISPOSABLE LIQUID FUEL BURNER

J. Alan Menter, Fayetteville, and Gerald A. Menter, Jamesville, both of N.Y., assignors to Hollowick Inc., Manlius, N.Y.

Filed May 24, 1985, Ser. No. 737,544

Int. Cl.⁴ F23D *3/24*

U.S. Cl. 431—320 **11 Claims**



5. A burner unit that includes

an open topped container for holding a quantity of liquid fuel,

a single piece wick having a body that is divided along a longitudinal axis into two half sections,

each half section further including a raised tab that is positioned upon the top surface thereof, each tab having a width that is less than the width of the half section and being folded over into face to face alignment whereby a shoulder extends to either side of the tabs at their base,

a lid for closing the top of the container,

a raised stud vertically mounted in the lid having a length that is less than the extended length of said tabs,

said stud having an opening that passes into the container for slidably receiving the tabs therein with the tab shoulders in abutting contact against the bottom surface of the lid and the ends of the tabs extending above the top of the stud, and

means to secure the body of the wick to the bottom of the lid.

11. A die cut wick that is formed from a single sheet of wicking material suitable for use in a fuel burner, said wick including a body having a plannar top surface that can be folded back upon itself along a lateral centerline that is perpendicular to said plannar surface to form two half sections, each half section including at least one tab that is upwardly disposed from said plannar surface and having a width that is less than the width of the half section so that the top surface of the body forms a shoulder that extends laterally from the base of each tab.

4,611,987

APPARATUS FOR FORMING MULTILAYER THERMOPLASTIC RESIN EXTRUSIONS

Granville J. Hahn; Raleigh N. Rutledge, both of Big Spring; Marion Johnson, Baytown; Jackie D. Murley, and Carl Blanchard, both of Big Spring, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jul. 23, 1984, Ser. No. 633,767

Int. Cl.⁴ B29C *47/30*

U.S. Cl. 425—131.1 **1 Claim**

1. Improved apparatus for forming multilayer, thermoplastic resin extrusions, comprising in combination:

first extruder means for plasticizing a first thermoplastic resin;

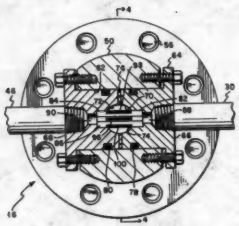
second extruder means for plasticizing a second thermoplastic resin;

die means for shaping said multilayer resins to the desired configuration;

injector means in fluid communication with said first and second extruder means and with said die means, said injector means including injector housing means having a resin flow passageway extending therethrough and a

transverse passageway extending therethrough intersecting said flow passageway;

first and second transverse housing members removeably located in said transverse passageway in sealing engagement with said injector housing means on each side of said flow passageway, said transverse housing members having recesses in juxtaposed ends thereof forming a portion of said flow passageway, having second recesses in each said end adjacent to said flow passageway and having a port extending into one of said second recesses;



means connecting the port in said transverse housing member to said second extruder means for receiving plasticized resin therefrom; and,

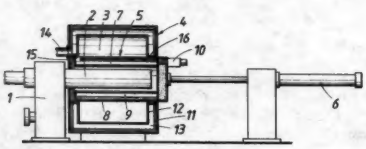
an injector body member removeably located in said second recesses supported by said housing members and extending across said flow passageway whereby said first plasticized resin is divided into two layers, said body member having a cavity therein in fluid communication with said port and having a slot extending into said cavity whereby a layer of said second plasticized resin can be deposited between said divided layers of said first plasticized resin.

4,611,988

COILER-FURNACE UNIT

Rudolf Buchegger, St. Florian, and Franz Hirschmanner, Leonding, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 30, 1985, Ser. No. 739,437
Claims priority, application Austria, Jun. 18, 1984, 1971/84
Int. Cl.[4] C21D *9/00*; F24J *3/00*
U.S. Cl. 432—183 **5 Claims**



1. In a coiler-furnace unit comprising

a heat-insulating housing,

a coiler mandrel extending in said housing, and

a heating tube which is axially movable to and from a heating position in which said heating tube surrounds and is adapted to heat said mandrel,

the improvement wherein

said heating tube comprises a radiant inner tube arranged to surround said mandrel in said heating position and a shell tube surrounding said radiant tube and defining with said radiant tube at least one hot gas passage having an outlet opening, and

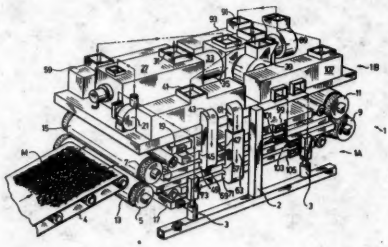
said housing consists of outer and inner walls defining between them at least one flow passage having a inlet opening arranged to communicate directly with said outlet opening in a predetermined axial position of said heating tube.

4,611,989

HORIZONTALLY EXTENDING CURING DEVICES

Erik Kersting, 67 Vanier Dr., Guelph, Ontario, Canada (N1G 2K9)

Filed Aug. 28, 1985, Ser. No. 770,252
Int. Cl.[4] F27B *9/00*; B65G *47/22*
U.S. Cl. 432—121 **19 Claims**



1. A curing device for at least partially curing a material in said device which comprises a curing region to receive the material, heating means for generating heated gases which are recycled through closed ducting means extending through said curing region from said heating means and fan means for blowing the heated gases through said ducting means, and carrier means for carrying the material through said curing region, said carrier means being heat conductive and in heat exchange with said ducting means whereby heat from the heated gases is transferred from said ducting means through said carrier means to the material to effect such curing without the gases blowing directly on and disturbing the material, said heating means having a first exhaust at a sufficiently high temperature to be substantially pollution free directly to atmosphere and a second exhaust to a mixing chamber for mixing with the relatively cooled recycled gases and controlling temperature of the heated gases in said ducting means according to degree of curing required.

4,611,990

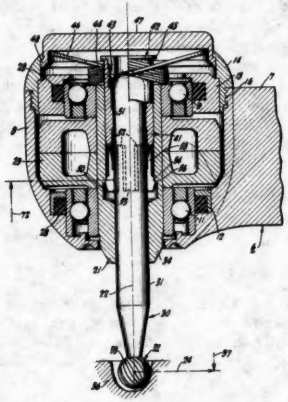
DENTAL HANDPIECE CONSTRUCTION

Joseph P. Lares, Redwood City, and Mark Cowell, San Carlos, both of Calif., assignors to Lares Research, San Carlos, Calif.

Filed Jan. 14, 1985, Ser. No. 691,142
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—129 **3 Claims**

1. A dental handpiece construction comprising a housing; a hollow spindle mounted in said housing for rotation about an axis; means in said housing for so rotating said spindle in a predetermined direction; means in said spindle for gripping a removable tool; said tool gripping means including an annular, integral quill slidably receivable coaxially within one end of said hollow spindle; means defining a first conical surface within said spindle converging toward said one end of said

spindle; radially resilient fingers on said quill; and means defining on each of said resilient fingers a second conical surface



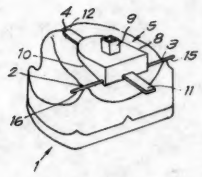
adapted to engage said first conical surface and to pass through said hollow spindle toward and out of said one end thereof.

4,611,991

APPARATUS FOR FIXING A PLASTER CAST IN AN ARTICULATOR FOR THE PRODUCTION OF DENTAL PROSTHESES

Lucien J. C. Heinix, Antwerp, Belgium, assignor to Alphadent, Belgium

Filed Jun. 12, 1985, Ser. No. 743,830
Claims priority, application Belgium, Sep. 3, 1984, 2/60489
Int. Cl.⁴ A61C *11/00*
U.S. Cl. 433—60 **9 Claims**



1. An apparatus for fixing a plaster cast in an articulator for the production of a dental prosthesis defining a plane encompassing the pterygomaxillary folds and the papilla incisiva, which apparatus comprises:

(a) a three-point support for engaging the pterygomaxillary folds and the papilla incisiva;

(b) the support including a body;

(c) two coaxial elongate projections secured to the body for engaging the pterygomaxillary folds;

(d) an elongate lath carried by the body and slidably movable with respect thereto for engaging the papilla incisiva; and

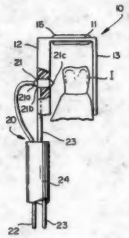
(e) wherein the longitudinal axes of the projections are disposed perpendicular to the longitudinal axis of the lath.

4,611,992

SPRAY GUARD FOR DENTAL TOOL

Oddvin Lokken, 131 Forest Ave., Rye, N.Y. 10580

Filed Nov. 2, 1984, Ser. No. 667,549
Int. Cl.⁴ A61C *1/16*
U.S. Cl. 433—116 **8 Claims**



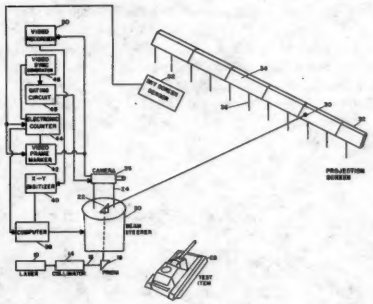
1. A dental tool for delivery of an aqueous fluid to teeth, comprising an elongated nozzle provided with an aqueous fluid inlet at one end and an aqueous fluid outlet at the other end, and an inverted U-shaped member having a base and integral, opposed legs depending therefrom, one of said legs having a bore extending therethrough, said nozzle being removably inserted in said bore with said nozzle outlet facing said other leg, whereby when the U-shaped member is placed over a tooth being treated, the leg closest to the operator of the tool acts to prevent material from splashing out of the patient's mouth.

4,611,993

LASER PROJECTED LIVE FIRE EVASIVE TARGET SYSTEM

C. David Brown, Harve de Grace, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1984, Ser. No. 615,656
Int. Cl.⁴ F41G *3/26*
U.S. Cl. 434—21 **9 Claims**



1. An apparatus for testing and evaluating live fire weapons systems comprising:

a. an operator controlled means for allowing a weapons system to launch an ordnance tracer projectile intended to intercept a target;

b. a vertical projection screen having a retroreflective surface located downrange from said weapons means;

c. means for projecting and steering a visible laser spot target upon said screen;

d. means for detecting said projectile as it approaches said laser spot target

e. said detecting means includes a video camera mounted on

said means for projecting and steering a visible laser spot target and boresighted with said laser target;

f. electro-optical sensor means for detecting when said projectile passes through the vertical plane defined by said projection screen;

g. means to mark the first video image after said projectile passes said vertical plane, said means being actuated by the signal from said electro-optical means; and

h. means for scoring said projectile within a specified area around the laser spot target.

4,611,994

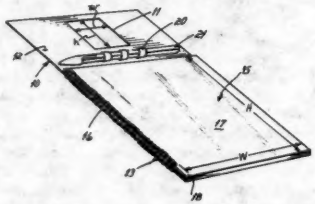
ARTIST'S SKETCHING DEVICE

Henry Glover, 3571 Zumstein Ave., Cincinnati, Ohio 45208

Filed May 20, 1985, Ser. No. 735,760

Int. Cl.[4] G09B *11/04*

U.S. Cl. 434—85 **6 Claims**



1. An artist's sketching device comprising,

a rigid rectangular back,

a pad of bound sheets of drawing paper secured to and supported on a lower portion of said back,

a rectangular viewing window formed through an upper portion of said back directly above said pad, said window having a height-to-width ratio approximately equal to the corresponding ratio of the sheets in said pad, and

means on said back for holding a drawing implement.

4,611,995

ELECTRONIC LANGUAGE LEARNING MACHINE

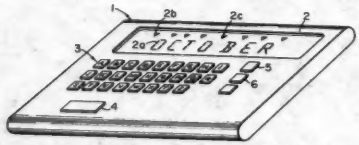
Ichiro Sado, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 444,211, Nov. 24, 1982, abandoned, which is a continuation of Ser. No. 194,990, Oct. 8, 1980, abandoned. This application Apr. 23, 1985, Ser. No. 725,524

Claims priority, application Japan, Oct. 16, 1979, 54-133943

Int. Cl.[4] G09B *19/06*

U.S. Cl. 434—157 **9 Claims**



1. An electronic language learning machine, comprising:

means to translate a language,

memory means for storing words of a language to be learned and associated marks, each mark representative of additional information relating to a different one of the words;

display means for visualizing words and marks;

selecting means for selecting any one of the words stored in said memory means to be displayed for study by a user of said language learning machine;

applying means for applying a selected word to said display means; and

manually actuatable means for causing said applying means to apply to said display means the mark associated with the selected word and stored in said memory means, after the beginning of the display of the selected word, where in response to actuation of said manually actuatable means said language learning machine accesses memory to provide location of where said mark should appear in relation to said selected word, as opposed to an operator inputting the location.

4,611,996

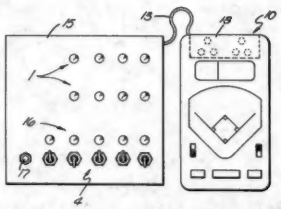
TEACHING MACHINE

Donald W. Stoner, 6028 Harvey Way, Lakewood, Calif. 90713

Continuation of Ser. No. 289,130, Aug. 1, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 692,863

Int. Cl.[4] G09B *7/00*

U.S. Cl. 434—202 **23 Claims**



1. A unitary electronic teaching and game apparatus comprising:

a teaching element including:

a means to present a problem to a student,

a means to enter said student's response to a problem, and

a means to determine virtue of said response,

and a game element including a means which presents a game to the student based on said virtue;

said teaching element and said game element being operatively interconnected so that the teaching element triggers the operation of the game element.

4,611,997

MOTIVATIONAL TEACHING AID FOR BEHAVIOR MODIFICATION

Mary Priore, 1574 Peace Pl., Columbus, Ohio 43209

Filed Feb. 21, 1985, Ser. No. 703,996

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—236 **11 Claims**

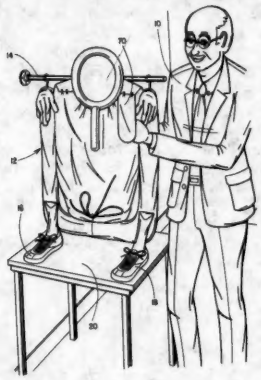
1. A motivational teaching aid comprising:

(a) a flexible sheet material forming a body having its opposite sides extending over a back portion toward its central axis to form a pair of separable flaps which are attached to the rear portion at its top and sides to form a pair of shoulders;

(b) a pair of pockets one formed on the interior surface of each of said flaps; and

(c) a simulated, nonreflective fabric mirror or picture frame

having a relatively flat central portion and attached directly to said flexible sheet body near said top and intermediate said sides in a position corresponding to and symbolic of a human face.

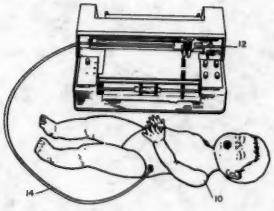


4,611,998

SIMULATOR FOR TEACHING NEONATAL RESUSCITATION

Rajam S. Ramamurthy, San Antonio, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Dec. 8, 1980, Ser. No. 214,437
Int. Cl.⁴ G09B *23/32*
U.S. Cl. 434—265 **17 Claims**



1. A neonatal cardiopulmonary resuscitation training simulator, comprising:

an infant mannequin including a torso defining a chest cavity covered by a chest wall, and a head attached to the torso having a mouth opening to an internal head cavity;

means disposed proximate the attachment point of the head and torso, for defining a simulated trachea in the mannequin to conduct the air introduced through the mouth opening during insufflation applied to the mannequin;

an inflatable, saccular bag structure disposed beneath the chest wall and interconnected with the trachea-simulating means to receive the air of applied insufflations for producing a rise and fall of the chest wall;

an air pressure transducer interconnected with the trachea-simulating means to receive air of applied insufflations, for producing a detectable response indicative of the rate and pressure of applied insufflations;

means disposed in the chest cavity, for responding to external cardiac massage manipulations applied to the chest wall;

a transducer actuated by the cardiac massage responsive means, for producing a detectable response indicative of the rate and depth of the cardiac massage; and

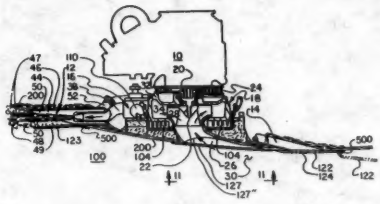
a recorder located externally of the mannequin, for making a record of the rate and depth of cardiac massage and the rate and pressure of insufflation based upon the transducer responses.

4,611,999

MARINE PROPULSION DEVICE WITH GASEOUS BOUNDARY LAYER FOR THRUST JET FLOW STREAM

Hendrick W. Haynes, Freelance Industrial/Wolfpak, P.O. Box 66152, Seattle, Wash. 98166

Continuation of Ser. No. 50,199, Jun. 20, 1979, Pat. No. 4,552,537. This application Dec. 16, 1982, Ser. No. 450,369
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.⁴ B63H *11/04*
U.S. Cl. 440—47 **5 Claims**



1. In combination with a marine craft including a hull having a submerged surface portion within which a discharge opening is formed and thrust jet propelling means for discharging a jet flow stream of water from the discharge opening along a discharge path, including a nozzle from which the jet flow stream emerges, a jacket having a predetermined passage diameter and length in enclosing relation to the jet flow stream, a source of gas, and means for introducing the gas into the jacket to form a gaseous boundary layer in surrounding relation to the jet flow stream, the improvement residing in reducing thrust deduction losses of the jet propelling means ordinarily resulting from deflection of the discharge path of the jet flow stream externally toward the surface portion of the hull, comprising means for pressurizing the gas to a predetermined pressure within the jacket, said jacket having an outlet end at the discharge opening substantially flush with the surface portion of the hull, and means mounting the nozzle in operative relation to the jacket and the discharge opening for the formation of the gaseous boundary layer against the hull and extending the gaseous boundary layer therefrom under said predetermined pressure externally of the hull for expansion relative to the jet flow stream under suction pressures developed externally on the surface portion of the hull adjacent thereto.

4,612,000

SINGLE-ENDED METAL HALIDE DISCHARGE LAMPS AND PROCESS OF MANUFACTURE

George J. English, Reading, and Harold L. Rothwell, Jr., Rowley, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 502,772, Jun. 9, 1983, abandoned. This application May 1, 1985, Ser. No. 728,454
Int. Cl.⁴ H01J *9/24*
U.S. Cl. 445—6 **5 Claims**

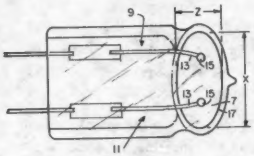
1. A process for manufacturing single-ended metal halide discharge lamps comprising the steps of;

forming an elliptical-shaped fused silica envelope;

sealing a pair of electrodes into one end of said elliptical-shaped envelope with each of said electrodes having a metal rod passing through said envelope and a spherical ball on the end of each metal rod within said envelope;

filling said elliptical-shaped envelope with a metal halide hosed high pressure mercury fill whereby substantially

uniform heating of said elliptical-shaped envelope is effected; and



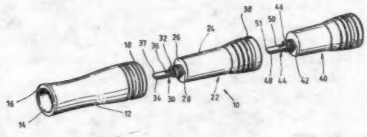
seasoning said discharge lamp for a time and at a temperature sufficient to cause development of protuberances on said spherical balls of said electrodes whereby an arc stability is enhanced.

4,612,001

GAME CALL

Murry Burnham, Marble Falls, Tex., assignor to Burnham Bros., Marble Falls, Tex.

Filed Nov. 28, 1984, Ser. No. 675,447
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—208 **1 Claim**



1. A game call comprising:

a barrel having a longitudinal bore extending therethrough defining an air passageway, a first end of said barrel defining a mouthpiece for introduction of air into said air passageway;

a first key disposed in an end of said barrel opposite said mouthpiece, said first keg having a bore extending therethrough so as to define an air passageway in communication with the air passageway in said barrel, said first keg including a reed assembly positioned in said air passageway and adapted to be actuated by an air stream; and

a second keg disposed in a free end of said first keg, said second keg having a length different than the length of said first keg, said first and second kegs being interchangeable, said second keg also having a bore extending therethrough so as to define an air passageway in communication with the air passageway in said first keg, said second keg including a reed assembly positioned in said air passageway and adapted to be actuated by an air stream.

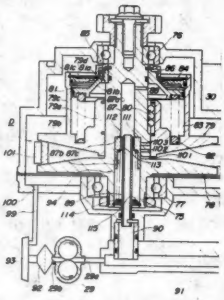
4,612,002

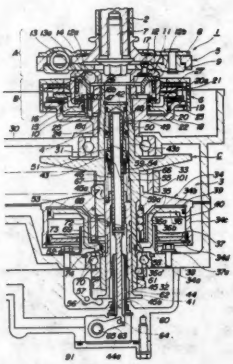
DEVICE FOR CONTROLLING PINCH FORCE OF A PULLEY IN AN INFINITELY VARIABLE TRANSMISSION

Kiyotaka Hayashi, Urawa; Kohei Ohzono, Fujimi, and Nobuyuki Yakigaya, Narashino, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,075
Claims priority, application Japan, Jul. 16, 1984, 59-147340
Int. Cl.[4] F16H *11/06*
U.S. Cl. 474—28 **4 Claims**

1. In an infinitely variable transmission equipped with a pulley including a shaft having a hydraulic fluid introducing passage formed therein and a peripheral wall, a stationary pulley element provided on said shaft, a movable pulley element axially slidably fitted on said shaft and arranged opposite said stationary pulley element, a hydraulic pressure chamber communicating with said hydraulic fluid introducing passage and disposed to be supplied with a hydraulic fluid for urging said movable pulley element toward said stationary pulley element, a hydraulic fluid source for supplying said hydraulic fluid to said hydraulic pressure chamber, and an endless belt engaged between said stationary pulley element and said movable pulley element, a control device for controlling the pinch force of said movable pulley element, comprising: a plurality of through bores formed through said peripheral wall of said shaft in a manner axially spaced from each other with predetermined intervals, for communicating said hydraulic fluid introducing passage with the outside of said shaft, said through bores being disposed such that said movable pulley element is urged by said hydraulic fluid in said hydraulic pressure chamber in a direction of closing said through bores, and at the same





time urged by a force of said endless belt acting thereupon against said hydraulic fluid in said hydraulic pressure chamber, in a direction of opening said through bores; a slider member axially slidably received within said hydraulic fluid introducing passage for opening and closing said through bores, said slider member having a pressure-receiving end surface urged by said hydraulic fluid in said hydraulic fluid introducing passage; and urging means urging said slider member in a direction of closing said through bores against the pressure of said hydraulic fluid acting upon said pressure-receiving end surface of said slider member; wherein the total opening area of said through bores is variable in response to a change in the position of said slider member which is determined by a difference between the pressure of said hydraulic fluid in said hydraulic fluid introducing passage and the urging force of said

urging means, as well as to a change in the position of said movable pulley element which is determined by a difference between the pressure of said hydraulic fluid in said hydraulic pressure chamber and the force of said endless belt acting upon said movable pulley element, to cause a stepwise change of pressure in said hydraulic fluid introducing passage and accordingly pressure in said hydraulic pressure chamber, to thereby control the pinch force of said movable pulley element applied to said endless belt.

4,612,003

HYDRAULIC SERVOMECHANISM

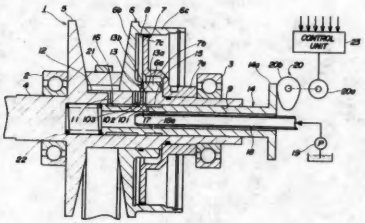
Kohei Ohzono, Fujimi; Mitsuru Saito, Koganei, and Kiyotaka Hayashi, Urawa, all of Japan, assignors to Honda Giken Koygo K.K., Tokyo, Japan

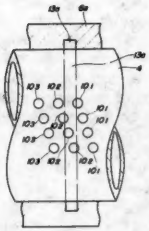
Filed Jul. 15, 1985, Ser. No. 755,073

Claims priority, application Japan, Jul. 16, 1984, 59-147342

Int. Cl.[4] F16H *11/04*

U.S. Cl. 474—28 **4 Claims**





1. A hydraulic servomechanism comprising: a basic body having an axial hole formed therein, a peripheral wall, and an outer peripheral surface; a stationary element provided on the outer peripheral surface of said basic body at a predetermined location and having an outer peripheral portion; a sliding element fitted on the outer peripheral surface of said basic body and also fitted with said stationary element for axial sliding movement relative to the basic body and the stationary element, said sliding element cooperating with said basic body and said stationary element to define therebetween a hydraulic pressure chamber having therein a hydraulic fluid acting upon said sliding element to cause axial displacement thereof; an urging member urging said sliding element against the pressure of said hydraulic fluid within said hydraulic pressure chamber; a hydraulic fluid supply source for generating the pressure of said hydraulic fluid supplied to said hydraulic pressure chamber; a plurality of through bores formed in the peripheral wall of said basic body and axially arranged at predetermined intervals for communicating between said axial hole of said basic body and said hydraulic pressure chamber, said through bores being disposed to be closed and opened by said sliding element; a communication hole formed in said sliding element for communicating between said through bores and said hydraulic pressure chamber; a control element axially slidably fitted in said axial hole of said basic body, said control element having formed therein a first communication passage for communicating, depending upon the axial position of said control element, said through bores with said hydraulic fluid supply source, and a second communication passage for communicating, depending upon the axial position of said control element, said through bores with a zone under a lower pressure; and driving means for changing the axial position of said control element for controlling the pressure of said hydraulic pressure within said hydraulic pressure chamber, to thereby control the axial position of said sliding element.

4,612,004

REAR DERAILLEUR FOR A BICYCLE

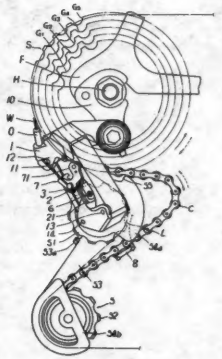
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 30, 1984, Ser. No. 636,013

Claims priority, application Japan, Aug. 2, 1983, 58-121081[U]; Aug. 4, 1983, 58-121985[U]; Aug. 4, 1983, 58-121986[U]

Int. Cl.[4] F16H *7/18*

U.S. Cl. 474—80 **6 Claims**



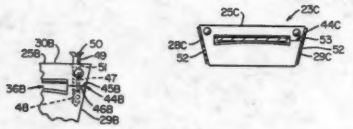
1. A rear derailleur for a bicycle for selectively switching a driving chain from one sprocket to another of a multi-stage sprocket assembly to change the bicycle speed, said derailleur comprising:

a chain guide comprising a guide pulley, a tension pulley and pulley plates, said pulley plates comprising an inner plate and outer plates, said pulley plates rotatably supporting said guide pulley and said tension pulley, said pulley plates for guiding said chain to a selected sprocket to which said chain is to be switched, one said outer plate being located outwardly of the multi-stage sprocket assembly and comprising a restraint means projecting radially outwardly relative to an outer peripheral edge of an entrance portion of said one outer plate through which said chain passes when moving in reverse, said restraint means for restraining said chain from being raised from said outer peripheral edge of said one outer plate to allow said chain to move smoothly toward said guide pulley.

4,612,005
TRANSVERSE BELT ELEMENTS FOR A BELT CONSTRUCTION

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 646,265, Aug. 31, 1984, abandoned, which is a division of Ser. No. 436,745, Oct. 25, 1982, Pat. No. 4,493,679. This application Sep. 3, 1985, Ser. No. 771,181
The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.
Int. Cl.⁴ F16G *5/00*
U.S. Cl. 474—201 **5 Claims**

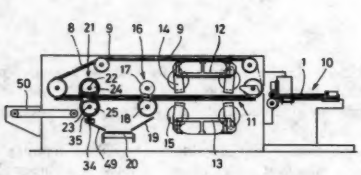


1. In a transverse belt element for an endless power transmission belt construction comprising an endless flexible carrier means and a plurality of said transverse belt elements assembled on said carrier means, said belt element having peripheral face means and a medial slot means passing therethrough for receiving part of said carrier means therein, said belt element having a slit means in said peripheral face means thereof originating in a side face thereof that leads to said slot means thereof and a hinge means in an opposed side face thereof spaced from said slit means that permits said belt element to have said slit means thereof opened sufficiently to permit at least part of said carrier means to be received therethrough for subsequent positioning in said slot means thereof and thereafter be moved to a closed position to prevent at least that part of said carrier means from escaping through said slit means, said belt element having two adjacent surfaces defining said slit means therebetween, the improvement wherein said belt element has fastening means for securing said adjacent surfaces thereof against each other so that said slit means thereof is maintained in said closed position.

4,612,006
DIE CUTTING APPARATUS

Masateru Tokuno, Nishinomiya, and Tetsuya Sawada, Kyoto, both of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Sep. 18, 1984, Ser. No. 651,767
Claims priority, application Japan, Sep. 30, 1983, 58-182549
Int. Cl.⁴ B31B *1/20*; B26D *7/18*
U.S. Cl. 493—342 **4 Claims**



1. In a die cutting apparatus for die cutting blanks of corrugated fiberboard and like materials, said apparatus having a blank supply means, an endless blank conveyor means having blank holding members arranged at regular intervals for receiving blanks from the blank supply means and conveying the blanks through the apparatus, means positioned along the conveyor for die cutting the blanks to divide them into a product portion, a scrap portion and a gripper margin with the gripper margin being held by the blank holding members, and means positioned along the conveyor downstream of the die cutting means for separating the scrap portion from the product portion and the gripper margin, an improved gripper margin removal means spaced downstream of said scrap portion separating means and comprising:

a pair of opposed roller means having parallel axes of rotation, on opposite sides of said conveyor means for receiving and rollingly supporting the blank conveyed therebetween and means for rotating said pair of opposed roller means in opposite directions, about said axes, each roller means having a notch in the periphery thereof opposed to the notch in the periphery of the other roller means and axially aligned with the blank holding members so as to allow the blank holding members on the conveyor means to pass between said pair of roller means when said notches are opposed;

gripper margin separating means and gripper margin releasing means adjacent said pair of roller means for separating the gripper margin from the product portion and for releasing the gripper margin from the blank holding members;

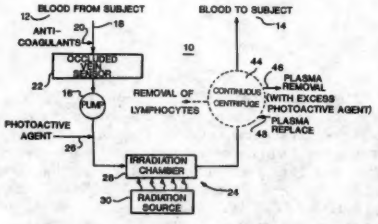
means on one of said pair of roller means engaging the gripper margin for causing the gripper margin to be carried away from the conveyor means as said one roller means rotates; and

means, operatively associated with said one roller means, for removing the gripper margin from said engaging means at a point spaced around the periphery of said one roller means from the point where the periphery of said one roller means is adjacent the conveyor means.

4,612,007
METHOD AND SYSTEM FOR EXTERNALLY TREATING THE BLOOD

Richard L. Edelson, 3 Rail Ct., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 274,319, Jun. 16, 1981, and Ser. No. 272,981, Jun. 12, 1981, which is a continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919. This application Dec. 8, 1982, Ser. No. 447,891
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.⁴ A61M *1/03*
U.S. Cl. 604—5 **9 Claims**



1. A method for reducing the functioning population of a blood constituent in the blood supply of a human subject, comprising the steps of:

withdrawing blood from said subject, and irradiating said withdrawn blood with UV radiation in the presence of an effective amount of a dissolved photoactive chemical agent specific for a receptor site in or on the blood constituent and capable when activated by said UV radiation of forming photo-adducts with blood constituent receptor sites, to thereby effect chemical bonding between said photoactivated chemical agent and said receptor sites, thereby initiating the destruction and/or removal of said blood constituent from the blood supply of the subject and returning the irradiated blood to said subject.

4,612,008

OSMOTIC DEVICE WITH DUAL THERMODYNAMIC ACTIVITY

Patrick S. L. Wong, Hayward; Brian Barclay, Sunnyvale; Joseph C. Deters, Mt. View, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 493,760, May 11, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,092

Int. Cl.[4] A61M *7/00, 31/00*

U.S. Cl. 604—892 27 Claims

1. An osmotic device for the delivery at a controlled rate a beneficial agent to an environment of use, the osmotic device comprising:

(a) a wall comprising in at least a part a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of a beneficial agent, the wall surrounding and forming:

(b) a compartment;

(c) a first composition in the compartment, said first composition comprising a beneficial agent, an osmagent that exhibits an osmotic pressure gradient across the wall against an external fluid, and an osmopolymer that exhibits an osmotic pressure gradient across the wall against an external fluid;

(d) a second composition in the compartment, said second composition comprising an osmagent that exhibits an osmotic pressure gradient across the wall against an external fluid, and an osmopolymer that exhibits an osmotic pressure gradient across the wall against an external fluid; and,

(e) at least one passageway in the wall communicating with the first composition and the exterior of the device for delivering the beneficial agent through the passageway from the device.

4,612,009

BIODEGRADABLE IMPLANT AND A METHOD FOR PREPARATION THEREOF

Jaroslav Drobník, and Helena Stepánková, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie Ved, Prague, Czechoslovakia

Filed Jun. 11, 1985, Ser. No. 743,518

Claims priority, application Czechoslovakia, Jun. 19, 1984, 4648-84

Int. Cl.[4] A61K *9/22*

U.S. Cl. 604—891 2 Claims

1. Biodegradable implant, wherein a matrix of the said implant is formed by a starch gel containing 0.2 to 2 weight percent of sodium chloride, plasticized by addition of 1 to 30 weight percent of glycerol, and suitably shaped, which contains a homogeneously dispersed microcrystalline cisplatin in the amount of 1 to 15 weight percent.

4,612,010

INFILTRATION PUMP

Edward N. Hamacher, 725 S. Lincoln, Apt. C-4, Spokane, Wash. 99204, and Mark A. Stolle, 21625 NE. 8th St., Redmond, Wash. 98053

Filed Aug. 14, 1985, Ser. No. 765,880

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—207 18 Claims

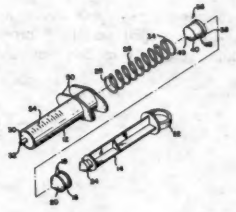
1. An infiltration pump for fluid, comprising:

an axially elongated body having an interior defining a hollow chamber of uniform internal cross-section for containing fluid and having an open end and an opposite fluid-dispensing end;

a fluid-displacing piston mounted for reciprocal motion within the chamber including a fluid displacing sea;

a biasing coil spring positioned inside the chamber between the fluid-dispensing end and the piston to bias the piston to an extended position, the spring sized to closely fit the inside of the chamber to prevent lateral movement of the spring; and

a spring adaptor inside the chamber and between the spring and piston having a first mating end portion for transferring the spring bias force evenly to the piston and second spring retaining portion to maintain the axial alignment of



the spring with the chamber, the first mating end portion having a contact surface conforming to the end of the piston and a radially extending surface, extending laterally opposite the contact surface and to form a seat for one end of the spring, the second spring retaining portion extending axially from the first mating end portion and sized to closely fit the inside of the coil spring.

4,612,011

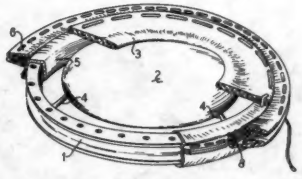
CENTRAL OCCLUDER SEMI-BIOLOGICAL HEART VALVE

Hans Kautzky, 427 W. Blair, West Chicago, Ill. 60185

Filed Jul. 22, 1983, Ser. No. 516,315

Int. Cl.[4] A61F *2/24*

U.S. Cl. 623—2 3 Claims



1. A semi-biological heart valve prosthesis comprising a mounting ring, said mounting ring having a plurality of inwardly directed spokes, a central occluder connected to and supported by said spokes, and a flat circular anti-thrombogenic membrane connected to said mounting ring along its outer circumference by suturing, said membrane having an aperture adapted to be selectively closed by said occluder, said central occluder being circular and having a diameter of 80%±10% of the inner diameter of the mounting ring, and is oval shaped in cross-section and approximately 20% to 30% wide axially in relation to said inner diameter.

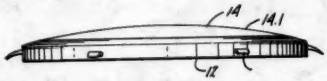
4,612,012

CORNEAL IMPLANT

Thomas C. White, 1127 Holly Dr., Sioux Falls, S. Dak. 55705

Filed Jul. 28, 1982, Ser. No. 402,740
Int. Cl.[4] A61F 2/14
U.S. Cl. 623—5 9 Claims

1. A corneal implant prosthesis having a transparent lenticule having a ring-shaped periphery provided with flange means extending generally radially outwardly therefrom for attachment to the sclera of the eye wall beyond the limbo-scleral ring, the peripheral ring, including flange means, bearing a thin coating of a biologically acceptable material providing a tissue-contacting surface.



4,612,013

PROCESS FOR THE TREATMENT OF CELLULOSE ACETATE FIBER

Guy R. Wallin, 1026 Barbee St., High Point, N.C. 27260

Filed Apr. 15, 1985, Ser. No. 723,529
Int. Cl.[4] D06M *13/34*
U.S. Cl. 8—196 8 Claims

1. A process for the crosslinking treatment of cellulose acetate fibrous material to improve the wrinkle-resistance thereof comprising:

(a) immersing said fibrous material in an aqueous or ethanolic solution containing between about 5% and 15% of an organic amine selected from the group consisting of o-phenylenediamine, triethylene tetramine and toluene diamine, said solution being maintained at a temperature in the range of about 70 degrees C. to 130 degrees C., and the duration of said immersion ranging between about 30 minutes and 12 hours,

(b) removing said fibrous material from said solution, and

(c) washing and drying said fibrous material.

4,612,014

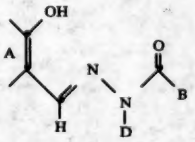
USE OF METAL COMPLEXES OF HYDRAZONES AS PIGMENTS

Franz Felix, Münchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 470,421, Feb. 28, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 782,596
Claims priority, application Switzerland, Mar. 9, 1982, 1438/82
Int. Cl.[4] D06P *5/12*
U.S. Cl. 8—452 12 Claims

1. A process for pigmenting high-molecular organic material, which comprises

incorporating therein a preformed transition-metal complex of a monohydrazone of the formula I



(I)

wherein A is an isocyclic or heterocyclic aromatic radical, B is a radical selected from the group consisting of unsubstituted or mono- or disubstituted benzene, naththalene, pyridine, pyrimidine, pyrazolone, quinoline, isoquinoline, pyrazole or coumarin where the substituents are halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, cyano, nitro, carboxy, C_2–C_7-alkoxycarbonyl, carbamoyl, phenyl, phenoxy, phenylcarbamoyl, benzoylamino, or phenyl, phenoxy, phenylcarbamoyl or benzoylamino each substituted by halogen, C_1–C_6-alkyl or C_1–C_6-alkoxy, and D is hydrogen, or if B is a phenyl or naphthyl group, D is hydrogen, or a carbonyl group which together with the structural element

forms a phthalimide or naphthalimide group.

4,612,015

LIQUID DYE FORMULATIONS CONTAINING ORGANIC CARBONATES

Rainer Dyllick-Brenzinger, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jul. 8, 1985, Ser. No. 752,597
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425512
Int. Cl.[4] C09B *67/44;* C09D *11/02*
U.S. Cl. 8—527 4 Claims

1. A liquid dye formulation comprising solvent soluble azo dye and an organic cabonate in an amount sufficient to stabilize said formulation against crystallization and precipitation after storage, said formulation having been stored for at least 3 weeks.

4,612,016

PROCESS FOR DYEING CELLULOSIC TEXTILE MATERIALS

Carl A. Jaeger, Steinen, Fed. Rep. of Germany; Hans-Ulrich Berendt, Allschwil, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,226
Claims priority, application Switzerland, Mar. 8, 1984, 1148/84
Int. Cl.[4] D06B *1/02;* D06P *1/52, 3/62*
U.S. Cl. 8—543 18 Claims

1. A process for dyeing cellulosic textile fabric with substantive or reactive dyes, which comprises impregnating said fabric with an aqueous dye liquor by a non-pad method and fixing the dyes by means of a heat treatment or by the cold pad-batch method, said dye liquor containing, in addition to dyes, a homopolymer or copolymer of acrylamide or methacrylamide, or a graft polymer of an adduct of an alkylene oxide and an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms and acrylamide or methacrylamide.

4,612,017

PELLETIZING WOOD

Courtney D. Lindell, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation of Ser. No. 235,599, Feb. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 187,705, Sep. 16, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,440
Int. Cl.[4] C10L *5/06, 5/20*
U.S. Cl. 44—10 B 9 Claims

1. A process for pelletizing particulated wood in a ring die pelleting mill which comprises drying the particulated wood to a mositure content less than about 19 weight percent and treating the particulated wood prior to pelleting with an aqueous wax emulsion and lignosulfonate, and particulated wood being treated with the wax emulsion and lignosulfonate in an amount, on the basis of wax solids and lignosulfonate solids, of from about 0.25 to about 2.5 weight percent of the wood with the wax solids being present in an amount of from about 5 to about 40 weight percent of the total wax and lignosulfonate solids.

4,612,018

ULTRASONIC DEBUBBLING METHOD AND APPARATUS

Norio Tsuboi; Noboru Furukawa, both of Hino, and Sadayuki Miyazawa, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

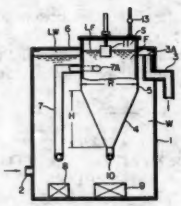
Filed Feb. 24, 1984, Ser. No. 583,348
Claims priority, application Japan, Feb. 28, 1983, 58-30965
Int. Cl.[4] B01D *51/08*
U.S. Cl. 55—15 14 Claims

1. A method for removing entrained bubbles from a liquid flowed through an inlet means and a debubbling chamber

situated within a heat and ultrasonic transmitting medium comprising:

flowing said liquid into said inlet means and further introducing said liquid into said debubbling chamber through said inlet means,

applying high-energy ultrasonic waves to said liquid inside said inlet means to generate cavitation bubbles in the liquid and to produce coherent groups of entrained and



cavitation bubbles, wherein said high-energy waves have an intensity capable of producing cavitation in the liquid to be debubbled, and

applying low-energy ultrasonic waves to said liquid in said debubbling chamber to force bubbles out of the liquid by the radiation pressure of the low-energy ultrasonic waves without producing cavitation, wherein said low-energy waves have an intensity incapable of producing cavitation in the liquid to be debubbled.

4,612,019

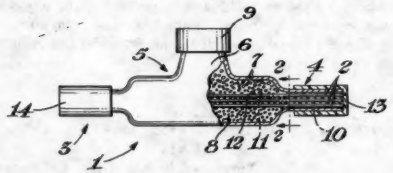
METHOD AND DEVICE FOR SEPARATING WATER VAPOR FROM AIR

Marsha L. Langhorst, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1982, Ser. No. 400,819

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **18 Claims**



1. A method of separating water vapor from air comprising contacting the first side of a water permeable membrane with air whereby the water vapor permeates from the first side of the membrane to the second side, said water permeable membrane being enclosed in a casing containing a desiccant between the second side of the membrane and inside surface of the casing.

4,612,020

METHOD OF DEGASIFYING LIQUID SULFUR WHICH CONTAINS HYDROGEN SULFIDE

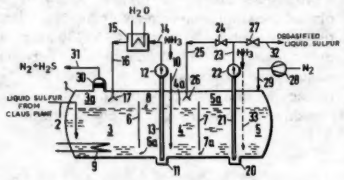
Herbert Fischer, Lollar, and Manfred Kriebel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankkfurt am Main, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,654

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417230

Int. Cl.⁴ B01D *19/00*

U.S. Cl. 55—40 **7 Claims**



1. A method of degasifying liquid sulfur which contains hydrogen sulfide, which comprises the steps of:

(a) passing said liquid sulfur in series through at least two chambers of a steel vessel, each of which is formed with a gas space above liquid sulfur therein, which are connected in series, the liquid sulfur being supplied to a first of said chambers at a temperature of 140 ° to 160° C.;

(b) withdrawing liquid sulfur from a second of said chambers and cooling the withdrawn liquid sulfur outside the vessel to a teperature of 120° C. to 135° C.;

(c) spraying the cooled liquid sulfur into the gas space of the first chamber;

(d) scavenging the gas spaces of the chambers with an oxygen-free inert gas, which is withdrawn from the vessel through the first chamber; and

(e) retaining the sulfur in the vessel for a residence time of 12 to 32 hours.

4,612,021

CONTACTING A GAS AND A LIQUID TO REMOVE AN UNWANTED GAS

Sarah E. L. Bland, 7 Dovehouse close, Bromham, Bedford MK43 8PS, Great Britain, and Murray H. Palmer, 14 Rectory Orchard, Lavendon, Olney, Buckinghamshire, England (MK46 4HB)

PCT No. PCT/GB84/00243, § 371 Date Mar. 7, 1985, § 102(e) Date Mar. 7, 1985, PCT Pub. No. WO85/00298, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 9, 1984, Ser. No. 711,569

Claims priority, application United Kingdom, Jul. 7, 1983, 8318450

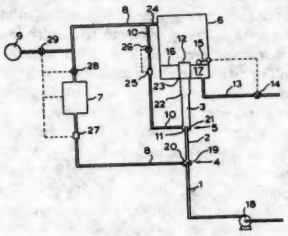
Int. Cl.⁴ B01D *19/00*

U.S. Cl. 55—53 **18 Claims**

1. Apparatus, for extracting a dissolved first gas from a liquid, comprising:

a liquid conduit for conveying the liquid; main gas ejector means provided in the liquid conduit and supplied with a second gas for dissolving the second gas in the liquid to replace the first gas; separation means for receiving liquid and a mixture of free first and second gases discharging from the liquid conduit and for separating said mixture from the discharged liquid; and cleaning means for receiving separated mixture from said separation means and for removing first gas from the received mixture; said cleaning means being connected to said main gas ejector means

and said main gas ejector means being operable to provide sufficient suction to draw separated mixture of said first and second gases from said separation means to said cleaning means.



4,612,022

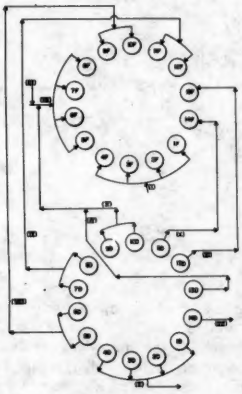
PROCESS FOR INCREASING THE CONCENTRATION OF ONE COMPONENT IN A MULTI-COMPONENT GASEOUS MIXTURE

W. Wes Berry, Lakeland, Fla., assignor to Progress Equities Incorporated, St. Petersburg, Fla.

Filed Jun. 21, 1985, Ser. No. 747,434

Int. Cl.[4] B01D *53/06*

U.S. Cl. 55—60 **9 Claims**



1. A process for enriching oxygen content of air comprising the steps of:

(i) providing a plurality of adsorbent-filled chambers moving about a circular path sequentially in periodic fluid communication with a plurality of fixed feed ports including adsorption stage feed ports and desorption stage feed ports and corresponding fixed discharge ports including adsorption stage discharge ports and desorption stage discharge ports at an end of said chambers opposite to said respective feed ports;

(ii) supplying a first stream of air at a first temperature to a first fixed adsorption stage feed port for delivery to said adsorbent-filled chambers, the oxygen in said first stream of air being loaded onto said adsorbent;

(iii) supplying a second stream of air at a second temperature greater than said first temperature to a fixed desorption stage feed port for delivery to said chambers, said second stream of air removing the oxygen loaded onto said adsorbent in step (ii) to produce a stream of air having an increased concentration of oxygen;

(iv) dividing said stream of air having an increased concentration of oxygen into a first enriched stream and a second enriched stream;

(v) cooling and supplying said first enriched stream to a second fixed adsorption stage feed port for delivery to said adsorbent-filled chambers, the oxygen in said first enriched stream being loaded onto said adsorbent; and

(vi) heating and supplying said second enriched stream to a second fixed desorption stage feed port for delivery to said chambers, said second enriched stream removing the oxygen loaded onto said adsorbent in step (v) to produce a stream having a further increased concentration of oxygen.

4,612,023

METHOD OF MANUFACTURING STRIA-FREE, BUBBLE-FREE AND HOMOGENEOUS QUARTZ-GLASS PLATES

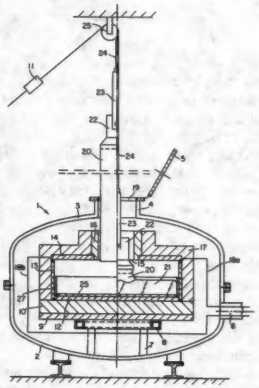
Karl Kreutzer, and Fritz Simmat, both of Gelnhausen, Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 501,478, Jun. 6, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,217

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226451

Int. Cl.[4] C03B *19/02, 5/02*

U.S. Cl. 65—32 **6 Claims**



1. A process for manufacturing virtually stria-free, bubble-free, and homogeneous quartz-glass plates of any desired configuration from a virtually stria-free, bubble-free and homogeneous solid quartz-glass rod, which method comprises suspending a free end of a solid quartz-glass rod, lowering said quartz-glass rod vertically through an opening in an electrical resistance heating means into a graphite crucible of a given configuration, said crucible being positioned inside a shell flooded with an inert gas, as said rod is being lowered through said opening, preheating the rod by a graphite sleeve extending from the crucible, said sleeve disposed around the rod and being a part of the electrical resistance heating means, said preheating being such that the temperature is increased from top to bottom of the rod, heating said rod while inside said crucible, to a flowing temperature ranging from 1700° to 1900° C. and after said rod has attained such temperature, lowering the rod again until the quartz-glass flows off said rod directly into contact with the bottom of the crucible, continuing the heating of said rod until the level of the quartz-glass that has flowed off said rod into the crucible equals the thickness of the desired plate, cooling the quartz-glass that has flowed off,

separating the remainder of the solid rod from the quartz-glass that has flowed off, and recovering the cooled quartz-glass from said crucible in the form of a plate.

4,612,024

METHOD AND APPARATUS FOR REHEATING OF CLEANED GASES SUBSEQUENT TO WET CLEANING OF RAW GASES

Hermann E. Müller-Odenwald, Mannheim, Fed. Rep. of Germany, assignor to SRM Svenska Rotor Maskiner Aktiebolag, Stockholm, Sweden

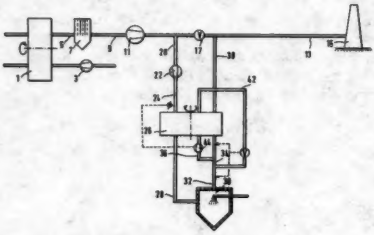
PCT No. PCT/EP84/00355, § 371 Date Jun. 7, 1985, § 102(e) Date Jun. 7, 1985, PCT Pub. No. WO85/02129, PCT Pub. Date May 23, 1985

PCT Filed Nov. 10, 1984, Ser. No. 744,045

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341021

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—80 **5 Claims**



1. A method for reheating of cleaned gases subsequent to the wet cleaning of raw gases by means of heat exchange between said raw and cleaned gases in a regenerative heat exchanger, comprising the steps of:

prior to the regenerative reheating of the cleaned gases by means of heat energy withdrawn from the raw gases, diverting from the previously wet-cleaned total flow of cleaned gases a partial flow of cleaned gases;

increasing the pressure of the partial flow of cleaned gases to exceed that of the raw gases in said regenerative heat exchanger;

heating said partial flow of cleaned gases in the regenerative heat exchanger and disposing the partial flow of cleaned gases therein so as to prevent an overflow of raw gases into the cleaned gases during the regenerative heat exchange step; and

adding the reheated partial flow of cleaned gases to the total flow of cleaned gases upstream of the regenerative heat exchanger.

4,612,025

PAINT SPRAY BOOTH CLEANING APPARATUS

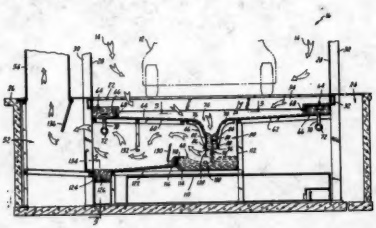
Ronald W. Sampey, Fowlerville, Mich., assignor to Tri-Mark Metal Corporation, Detroit, Mich.

Filed Mar. 29, 1985, Ser. No. 717,670

Int. Cl.[4] B01D *47/10*

U.S. Cl. 55—223 **20 Claims**

1. Apparatus for removing particles of paint entrained in air from an application chamber of a paint spray booth comprising, a single elongated nozzle extending substantially the entire length of said application chamber, bottom walls extending lengthwise and crosswise of said application chamber and converging downwardly toward and merging into said nozzle, a lower chamber below said bottom walls and sealingly surrounding and communicating with said nozzle, an air outlet from said lower chamber constructed and arranged to exhaust air therefrom, air moving means to cause air with entrained paint particles from said application chamber to flow generally downwardly from said application chamber through said nozzle and into said lower chamber, a distributor associated with said bottom walls and constructed and arranged to cause water to flow over substantially the entire surface of said bottom walls and generally downwardly across said walls and into said nozzle to avoid adherence of paint particles to said walls, an open container in said lower chamber underlying said nozzle and constructed and arranged to provide a pool of water underlying said nozzle at least substantially throughout the length of said nozzle and spaced from and below an outlet of said nozzle, said nozzle having a pair of side walls with a generally curved portion extending substantially the entire length of said booth, being laterally spaced apart and constructed and arranged to provide an inlet through which air with entrained paint particles from said application chamber flows and said water from said bottom walls flows across said side walls over at least substantially the entire surface of said side walls to avoid adherence of paint particles thereto, a restriction in said nozzle below said rounded portion, extending at least substantially the entire length of said nozzle, and constructed and arranged to atomize the water into minute particles and disperse such water particles in the air so that the mixture thereof flows through the entire restriction at a higher speed than the speed of the air flowing through the inlet of said nozzle, said



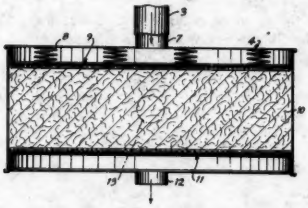
inlet merging into said restriction, a discharge orifice below said restriction and adjacent the outlet of said nozzle, extending at least substantially the entire length of said nozzle, and constructed and arranged to discharge the mixture with a speed substantially greater than the speed of the mixture in the restriction so that the mixture impinges on the pool of water in said container, said discharge orifice and said container being constructed and arranged such that said orifice is spaced apart about 6 to 15 inches from the upper surface of the pool of water in the container when static with no discharge from said orifice and the mixture when discharged from said orifice produces a depression in the pool of water having a maximum depth which is substantial and not more than about 7 inches below the upper surface of the pool of water when static, said restriction merging into said discharge orifice, and said nozzle and said air moving means being constructed, arranged and sized such that when operating air with entrained paint particles flows through the lower portion of said inlet with a velocity of at least about 1300 feet per minute, flows through the lower portion of said restriction with a velocity of at least about 1,800 feet per minute and flows through said discharge orifice with a velocity in the range of about 4,500 to 7,500 feet per minute, whereby particles of paint are deposited in the pool of water and removed from the air.

4,612,026

AIR TREATMENT UNIT PROVIDING A FILTRATION SYSTEM FOR REMOVING ETHYLENE OXIDE FROM A CONTAMINATED ENVIRONMENT

Frank J. Pollara, 240 E. Pierrepont Ave., Rutherford, N.J. 07070, and Louis W. Liddle, 117 Livingston St., Clifton, N.J. 07013

Filed Oct. 18, 1985, Ser. No. 788,847
Int. Cl.[4] B01D *53/02*; G01N *21/78*
U.S. Cl. 55—274 2 Claims



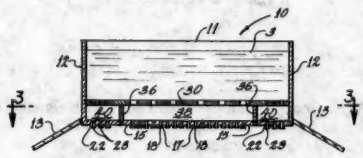
1. Removal air filter used as part of air treatment unit for use in a contaminated environment, comprising of a blower assembly for sucking in outside air and conveying it to removable air filter being equipped with a coarse filter element for removing solid particles, then being forced through a granular activated carbon media impregnated with metallic oxides for the specific removal of ethylene oxide vapors from the incoming air by absorption, and finally forcing the incoming air through a fine filter element for fine particle removal and conveying the filter free air to the enclosed environment, this air filter taking a flattened cylindrical form which has, on one of its faces an incoming polluted air orifice to allow access to the coarse filter element on the front portion of the cylinder followed by the activated granular carbon media where the ethylene oxide is absorbed and finally forced through the face of the fine filter element, these faces being attached mechanically to a leak-proof frame with a blower assembly before the orifice to the coarse filter element so that the polluted air is forced through the said filter elements and absorption media to deliver purified air to the enclosed environment with an ethylene oxide detector for determining ETO saturation concentration of 0.3 ppm.

4,612,027

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Jerome F. Marra, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 29, 1985, Ser. No. 770,491
Int. Cl.[4] C03B *37/085*
U.S. Cl. 65—1 24 Claims



1. A method of forming glass filaments from a feeder comprising:

supplying streams of molten glass to be attenuated into filaments from a first field of orifices in said feeder;

supplying streams of molten glass to be attenuated into filaments from a second field of orifices in said feeder;

attenuating the streams of glass into filaments; and

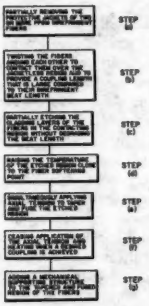
reducing the pressure of the molten glass at the first field of orifices to a pressure less than the internal pressure of a bead formed at an orifice upon the cessation of filament attenuation at that orifice, but greater than the internal pressure of a forming cone of glass established during attenuation at one of said orifices of said first field without so reducing the pressure of the molten glass at the second field of orifices.

4,612,028

POLARIZATION-PRESERVING SINGLE MODE FIBER COUPLER

Moges Abebe, Washington, D.C.; William K. Burns, Alexandria, and Carl A. Villarruel, Burke, both of Va., assignors to The United States of America as represented by The Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 561,866, Dec. 16, 1983, abandoned.
This application Oct. 7, 1985, Ser. No. 785,107
Int. Cl.[4] C03B *23/20*
U.S. Cl. 65—4.2 3 Claims



1. A method of fabricating a polarization-preserving single mode fiber coupler not requiring mutual alignment of the fiber polarization axes provided that the actual misalignment is not close to 90 degrees, comprising the steps of:

(a) forming a jacketless region by removing protective jacket material from two or more polarization-preserving single-mode fibers, each fiber being birefringent and comprising at least a core, an inner cladding, and an assymetrical stress inducing layer outside of the inner cladding, such that the fibers have a birefringent beat length, and an outer cladding;

(b) twisting the fibers around each other to bring them into intimate contact over the jacketless region in order to form a coupling length, said coupling length exceeding the said birefringent beat length of the fibers;

(c) etching the outer cladding of the fibers in the said coupling length as far as possible without degrading the said birefringent beat length of the fibers;

(d) heating the etched cladding to a temperature that is near the softening point of the fibers;

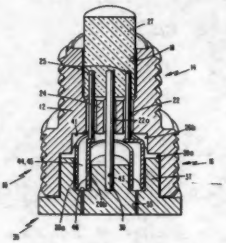
(e) simultaneously applying axial tension to all the fibers to taper and fuse the said coupling length of the fibers;

4,612,029

METHOD AND APPARATUS FOR PERFORMING IN-SITU VACUUM-ASSISTED METAL TO GLASS SEALING

Daniel P. Kramer, Dayton, and Richard T. Massey, Hamilton, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1985, Ser. No. 756,115
Int. Cl.[4] C03B 27/02
U.S. Cl. 65—59.24 11 Claims



1. Apparatus for assembling and fusing glass to metal in a glass-metal electrical component having a metallic shell formed with upper and lower recesses connected together by longitudinal passages, a pair of metal rings and plural metal pins, said metal rings and pins being mounted within the lower recess and spaced from sidewalls thereof by insulative glass to establish electrical feed-throughs, comprising:

(a) a fixture formed with a component assembly area on an upper surface thereof, said component assembly area including a central mounting projection formed concentrically within a sleeve-like projection to establish an annular cavity between sidewalls of said projections respectively, said fixture enabling initial assembly of said component by (1) mounting said pair of metal rings within the cavity so that said rings are spaced from each other to define an annular space therebetween; (2) fitting said metallic shell into contact with an outer nesting surface of said first projection; and (3) seating a glass pre-form into the upper recess while inserting said pins extending from the glass pre-form through the passages into contact with the metal rings; said fixture being further formed with a passageway having one end communicating with said annular cavity;

(b) means for heating said initially assembled component to a predetermined temperature at which said glass pre-form melts; and

(c) means connected to an opposite end of said passageway for vacuumizing said passages and lower recess by applying suction pressure to said annular cavity, said vacuumizing means assisting the flow of melted glass through said passages in a quantity sufficient to substantially fill said annular space with glass material, as well as an interior region between said metal rings and shell and said passages, thereby providing insulative separation between said metallic shell and said rings and pins.

4,612,030

METHOD AND APPARATUS FOR MAKING VARIEGATED, CATHEDRAL, ANTIQUE OR FLASHED GLASS IN A CONTINUOUS SHEET

Ronald E. Smids, 29210 NE. 2nd Pl., Carnation, Wash. 98014

Filed Jun. 11, 1985, Ser. No. 743,686
Int. Cl.[4] C03B 15/04, 15/10
U.S. Cl. 65—91 45 Claims

1. A method of making flashed glass in continuous sheet form, comprising:

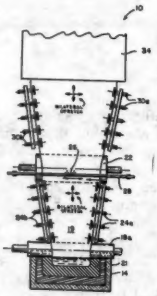
heating a first quantity glass with one color and a second quantity of glass with another color to the molten state;

separately introducing each of the differently colored molten glass into a vessel adjacent to a pair of counterrotating forming rollers such that the differently colored molten glass contact each other along an interface to form a laminated molten glass mixture having two different colored layers;

feeding the laminated molten glass mixture into the feed side of the pair of forming rollers which press the layers of the laminated molten glass mixture together into a continuous laminated plastic elongated sheet;

stretching the continuous laminated plastic elongated sheet in the machine direction, i.e., the direction of sheet travel produced by the forming rollers;

simultaneously with the stretching in the machine direction stretching the continuous laminated plastic elongated



sheet in a direction transverse to the machine direction; and

annealing the stretched laminated plastic glass sheet.

16. A method of making cathedral glass or the like in continuous sheet form, comprising:

heating a quantity of glass to the molten state;

introducing the molten glass into a vessel adjacent to a pair of counterrotating forming rollers;

feeding the molten glass into the feed side of the forming rollers which press the molten glass into a continuous plastic elongated sheet;

stretching the continuous plastic elongated sheet in the machine direction, i.e., the direction of sheet travel produced by the forming rollers;

simultaneously with the stretching in the machine direction stretching the continuous plastic elongated sheet in a direction transverse to the machine direction; and

annealing the stretched plastic glass sheet.

4,612,031

METHOD AND APPARATUS FOR SHAPING GLASS SHEETS ON SHAPING MOLDS WITH FLOTATION BLOCKS

Terry A. Bennett, Monroeville; William B. Zimmerman, Pittsburgh, and Michael B. Maslanka, Irwin, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

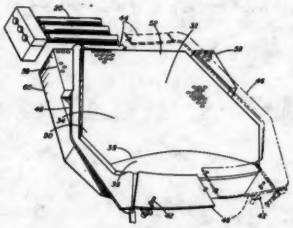
Filed Jun. 24, 1985, Ser. No. 748,067
Int. Cl.[4] C03B 23/02
U.S. Cl. 65—106 8 Claims

1. An improved apparatus for shaping a hot glass sheet including a furnace, a shaping station having an upper mold, a lower gas hearth bed positioned below said upper mold to support said glass sheet to be shaped on a layer of pressurized hot gas, and a vertically reciprocating outline mold surrounding said gas hearth bed wherein selected side portions of said hot glass sheet to be shaped are wider than a trailing portion of said glass sheet, such that as said glass sheet is conveyed from

said furnace, over a series of transfer rolls and into said shaping station, said selected side portions subsequently overhang selected portions of said outline mold wherein the improvement comprises:

gas hearth flotation blocks positioned external of said selected portions of said outline mold in positions to support said selected overhanging side portions of said glass sheet as it is conveyed to and positioned over said gas hearth bed.

7. An improved method of shaping glass sheets having selected side portions wider than a trailing portion of said glass sheet to be shaped, including the steps of heating said glass



sheet to its heat deformation temperature, conveying said heated glass sheet to a shaping station, adjusting the speed of said conveying step for accelerated transfer of said glass sheet to said shaping station, positioning said glass sheet on a support bed, and lifting said glass sheet with a lifting member into engagement with an upper mold, wherein selected side portions substantially overhang said lifting member as said glass sheet is conveyed over said sheet support bed, the improvement comprising:

supporting said overhanging side portions of said glass sheet during said conveying step by flotation blocks so as to prevent said glass sheet from contacting said sheet support bed prior to said lifting step.

4,612,032

GLASSWARE FORMING MACHINE WITH PARISON CATCHING DEVICE

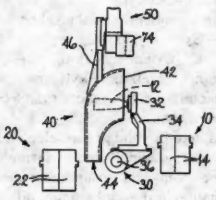
Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 31, 1984, Ser. No. 666,691

Claims priority, application United Kingdom, Nov. 16, 1983, 8330573

Int. Cl.[4] C03B *9/44*

U.S. Cl. 65—165 **8 Claims**



1. A glassware forming machine of the individual section type comprising a first mould arrangement by which gobs of molten glass are moulded into parisons, a second mould arrangement by which parisons moulded by the first mould arrangement are moulded into articles of glassware, transferring means operable to transfer parisons from the first mould arrangement to the second mould arrangement, the transferring means comprising a neck ring operable to grip a neck portion of a parison in the first mould arrangement and release it in the second mould arrangement, an arm on which the neck ring is mounted, and turning means operable to turn the arm about a horizontal axis to move the neck ring between the first and the second mould arrangements, a parison catching device mounted on said machine, moving means for vertically moving said parison catching device between an out-of-the-way position wherein it is positioned above the path of the neck ring as the neck ring moves between the first and second mould arrangements and an intercepting position wherein it is positioned in the path of a parison being transferred from the final mould arrangement to the second mould arrangement by the transferring means so that the catching device, in its intercepting position, can receive a parison from the transferring device and guide it to a cullet chute, the out-of-the-way position being above the intercepting position.

4,612,033

MACHINE FOR MAKING PRESSED GLASS PARTS

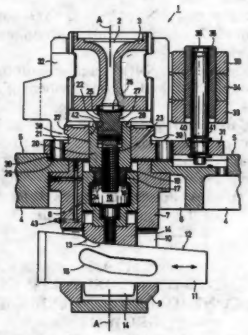
Wilfried Halbritter, Lohr am Main, Fed. Rep. of Germany, assignor to Positron Gesellschaft für Anlagen zur Verformung thermoplastischer Massen mbH, Glattbach, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,130

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428952

Int. Cl.[4] C03B *11/10*

U.S. Cl. 65—313 **9 Claims**



1. Machine for making pressed glass parts with a surface for joining with a further glass part, and more particularly for making cups and stems, with a rotatable table (4) having several stations with one bottom plate (31) each with at least one centering means (37) for an exchangeably mountable mold (3, 3a), with one lift drive (61) each rotating with the machine table for a rod (25), said rod coacting with the said mold and forming the said joining surface and being slightly lowerable after the forming, with a first vertical guidance means (8) for the said lift drive mounted together with the latter in the said machine table and with a thereabove lying second vertical guidance means (20) for said rod mounted in the bottom plate (31), and with a means (23/24) for setting the vertical distance between rod and lift drive, said machine being characterized in that the first vertical guidance element (8) is mounted over its entire length underneath an upper boundary surface (5) of machine table (4) and inside the latter, and in that the bottom plate (31) with the second vertical guidance element (20) is mounted on the said machine table directly.

4,612,034
HERBICIDAL FORMULATION

Paul J. Kruger, Middlesex, and George Schwartzkopf, Franklin Township, Bexar County, both of N.J., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 453,810, Dec. 27, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 554,769

Int. Cl.[4] A01N *59/24*

U.S. Cl. 71—80 **2 Claims**

1. A method of herbicidally controlling weeds selected from the groups consisting of annual grasses, annual broadleaves, perennial grasses and perennial broadleaves by contacting said weeds with a herbicidally effective amount of a composition sufficient to provide from about 0.1 to about 0.5 pound per acre of the isopropylamine salt of glyphosate and an effective potentiating amount of from about 2 to about 4 pounds per acre of ammonium thiocyanate, wherein the weight ratio of ammonium thiocyanate to the isopropylamine salt of glyphosate in the composition is within the range of from about 4:1 to about 40:1, sufficient to enhance the herbicidal activity of the glyphosate.

4,612,035
HERBICIDAL N-[(4-BROMO-6-METHOXYPYRIMIDIN-2-YL)AMINOCARBONYL]-2,3-DIHYDRO-(2-METHYL)-BENZO[B]THIOPHENE-7-SULFONAMIDES, 1,1-DIOXIDE

Hugh M. Brown, West Grove, Pa., and Robert J. Pasteris, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 9, 1984, Ser. No. 608,556

Int. Cl.[4] A01N *43/02;* **C07D** *239/02*

U.S. Cl. 71—90 **6 Claims**

1. The compound N-[(4-bromo-6-methoxypyrimidin-2-yl)aminocarbonyl]-2,3-dihydrobenzo[b]thiophene-7-sulfonamide, 1,1-dioxide.

2. The compound N-[(4-bromo-6-methoxypyrimidin-2-yl)aminocarbonyl]-2,3-dihydro-2-methylbenzo[b]thiophene-7-sulfonamide, 1,1-dioxide.

5. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of the compound of claim 1.

6. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of the compound of claim 2.

4,612,036
CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Durkheim; Michael Keil, Freinsheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

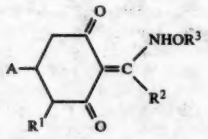
Continuation of Ser. No. 573,617, Jan. 25, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 750,997

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303182

Int. Cl.[4] A01N *43/10, 43/18;* **C07D** *333/48, 335/02*

U.S. Cl. 71—91 **11 Claims**

1. A cyclohexane-1,3-dione derivative of the formula



(I)

where A is a saturated or unsaturated 4-membered to 7-membered ring which contains 1 or 2 sulfinyl or sulfonyl groups and is unsubstituted or substituted by not more than 3 alkyl groups, each of not more than 4 carbon atoms, 2 alkenyl groups, each of not more than 6 carbon atoms, or 3 alkoxy groups, each of not more than 2 carbon atoms, R^1 is hydrogen, methoxycarbonyl, ethoxycarbonyl, methyl or cyano, R^2 is alkyl of 1 to 4 carbon atoms and R^3 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms or haloalkenyl of 3 or 4 carbon atoms which has 1 to 3 halogen substituents, or is propargyl, or a salt thereof.

10. A process for combatting the growth of unwanted plants, wherein the unwanted plants and/or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a cyclohexane-1,3-dione derivative of the formula I as defined in claim 1, or a salt thereof.

4,612,037
NOVEL SULFONYLUREAS AND SULFONYLTHIOUREAS, AND METHOD OF USE THEREOF AS HERBICIDES AND/OR GROWTH REGULATORS

Beat Böhner, Binningen; Werner Föry, Basel; Rolf Schurter, Binningen, all of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

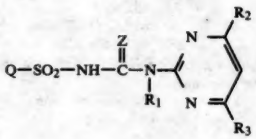
Filed May 19, 1983, Ser. No. 496,325

Claims priority, application Switzerland, May 28, 1982, 3314/82

Int. Cl.[4] C07D *403/12;* **A01N** *47/36*

U.S. Cl. 71—92 **13 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or C_1–C_5alkyl,

R_2 and R_3, each independently of the other, are hydrogen, C_1–C_5alkyl, C_1–C_5alkoxy, C_1–C_5alkylthio, C_1–C_5haloalkyl, halogen, C_1–C_5haloalkylthio, C_1–C_4alkylamino, C_1–C_4dialkylamino, an alkoxyalkyl group or alkoxyalkoxy group, each containing not more than 6 carbon atoms,

Z is oxygen or sulfur, and

Q is a 6-membered heterocyclic group selected from pyrimidine, pyridazine, pyrazine, and triazine and bound through a carbon atom, said group being unsubstituted or substituted by halogen, pseudohalogen, nitro, alkyl, haloalkyl, alkoxy, alkylthio, haloalkoxy, haloalkylthio, amino, alkylamino, dialkylamino, alkylcarbonylamino, alkylcarbonyl, alkoxycarbonyl, alkylthiocarbonyl, carbamoyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylsulfinyl, alkylsulfonyl, alkenyloxy, alkynyloxy, C_1–C_4 cyanoalkyl, C_3–C_5 alkoxyalkoxy or by phenyl, phenoxy or phenylthio, which are unsubstituted or substituted by halogen, nitro, cyano, alkyl, alkoxy, haloalkyl or haloalkoxy, or by benzyl or benzyl substituted by halogen and/or alkyl,

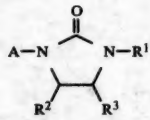
or salt thereof.

4,612,038
HERBICIDALLY ACTIVE 3-OXADIAZOLYL-2-IMIDAZOLIDINONES

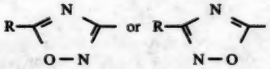
Barry Van Gemert, Massillon; Jerome M. Lavanish, Akron, and James A. Schwindeman, Fairlawn, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 24, 1985, Ser. No. 748,511
Int. Cl.[4] A01N *43/82*; C07D *413/04*
U.S. Cl. 71—92 4 Claims

1. A compound represented by the formula:



when
A is



when R is selected from up to C_6 alkyl, haloalkyl or cycloalkyl, up to C_5 alkenyl or alkynyl, $—R^4—O—R^5$ or $R^4—S—R^5$ wherein R^4 is up to C_6 alkylene and R^5 is up to C_6 alkyl or phenyl or benzyl;
R^1 is up to C_3 alkyl or allyl
R^2 and R^3 are selected from hydrogen, hydroxy or

$$R^6—N—(CH_2)_n—OR^7$$

with the proviso that one of R^2 or R^3 must be

$$R^6—\underset{|}{N}—(CH_2)_n—OR^7$$

wherein:
R^6 is hydrogen or up to C_6 alkyl, haloalkyl, alkoxy or alkoxylalkyl or acyl;
R^7 is hydrogen, up to C_6 alkyl, alkylcarbonyl or amino carbonyl; and
n is 2, 3 or 4.

4. In a method of controlling weeds wherein a herbicidally effective amount of herbicide is applied to a growth medium prior to emergence of weeds therefrom or to the weeds subsequent to their emergence from the growth medium, the improvement residing in using as the herbicide a compound or mixture of compounds defined in claim 1.

4,612,039
PRODUCTION OF PURE COBALT METAL POWDER

Richard A. Scheithauer; Clarence D. Vanderpool, and Michael J. Miller, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

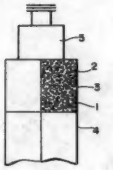
Filed Oct. 31, 1985, Ser. No. 793,420
Int. Cl.[4] C22B *15/00*
U.S. Cl. 75—0.5 AA 5 Claims

1. A method for producing pure cobalt metal powder, said method comprising:
(a) reducing a cobalt containing source material to produce an intermediate cobalt metal;
(b) contacting said intermediate cobalt metal with an ammoniacal ammonium halide solution and a catalyst, with oxidation to form a solution of hexamminecobalt (III) ions wherein said oxidation is carried out with an oxidizing agent selected from the group consisting of air and hydrogen peroxide;
(c) separating the resulting hexamminecobalt (III) solution from insoluble material;
(d) adding a sufficient amount of a halide salt to said hexamminecobalt (III) solution to form a precipitate consisting essentially of hexamminecobalt (III) halide;
(e) separating the hexamminecobalt (III) halide precipitate from the resulting mother liquor;
(f) dissolving said hexamminecobalt (III) halide precipitate in water and adjusting the pH of the resulting hexamminecobalt (III) halide solution to greater than about 10 with a base while heating the pH adjusted solution at a sufficient temperature for a sufficient time to decompose said hexamminecobalt (III) halide and form an insoluble cobalt oxide containing material;
(g) separating said insoluble cobalt oxide containing material form the resulting mother liquor; and
(h) reducing said cobalt oxide containing material to pure cobalt powder.

4,612,040
CONSUMABLE ELECTRODE FOR PRODUCTION OF NB-TI ALLOYS

Masaaki Koizumi, Yokohama; Nobuo Fukada, and Hiroyuki Okano, both of Samukawa, all of Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,136
Claims priority, application Japan, May 29, 1984, 59-107478
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.65 8 Claims



1. A consumable electrode for the production of NbTi alloys consisting essentially of a compact body formed by compressing a uniform mixture of niobium chips of not more than 5 mm in thickness, no more than 50 mm in width and no more than 300 mm in length, and sponge titanium.

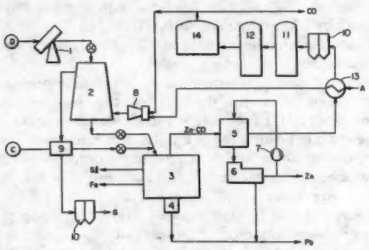
4,612,041
PROCESS FOR RECOVERING VALUABLE METALS FROM AN IRON DUST CONTAINING A HIGHER CONTENT OF ZINC

Toshio Matsuoka, and Shinichi Kurozu, both of Niihama, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,503
Claims priority, application Japan, Sep. 11, 1984, 59-190185; Aug. 29, 1985, 60-190153
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.14 2 Claims

1. A process for recovering valuable metals from an iron dust containing zinc at a high concentration therein comprising:
(1) pelleting the dust into pellets with a pelletizer 1;
(2) preheating the pellets in a shaft type furnace 2 for drying them, removing the loss on ignition and burning solid carbonaceous materials in the pellets to remove the materials by means of charging a hot gas from a furnace 8;
(3) charging the resulting pellets into an induction furnace 3 together with a carbonaceous solid reductant;
(4) melting and reducing iron oxide, zinc oxide and lead oxide contained in said pellets in the furnace 3 with the solid reductant so that reduced zinc and a part of reduced lead are vaporized and sent to a condenser 5;

(5) separating zinc and lead in a gaseous state by condensing them by the condenser 5 to obtain crude zinc and lead; and



(6) separating iron and lead by means of the difference of their specific gravities to obtain molten pig iron and crude lead in the induction furnace 3, respectively.

4,612,042

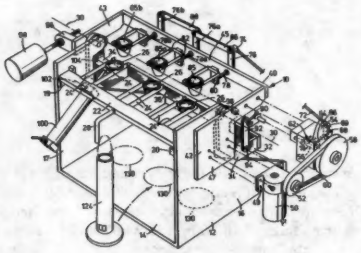
METHOD FOR AUTOMATICALLY FLUXING AND CASTING SAMPLES

John H. Kelly, Burlington, and Leonard E. Guest, Binbrook, both of Canada, assignors to Stelco Inc., Hamilton, Canada

Division of Ser. No. 601,687, Apr. 18, 1984, Pat. No. 4,563,146. This application Jul. 15, 1985, Ser. No. 754,991

Int. Cl.[4] C22B 7/04

U.S. Cl. 75—24 **5 Claims**



1. A method of fluxing an oxide sample, comprising the steps:

placing the sample in a crucible having a central axis and a bottom,

heating the crucible and thus the oxide sample,

and applying to the crucible a motion whereby the central axis moves to describe a substantially conical surface having an apex located substantially on the central axis and spaced from the bottom of the crucible by a distance substantially equal to or less than the crucible height,

and restraining the crucible against rotation about its own axis.

4,612,043

STEEL MAKING METHOD

Ronald D. Gray, Bethel Park, and Michael A. Orehoski, Duquesne, both of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1984, Ser. No. 595,313

Int. Cl.[4] C21C 7/10

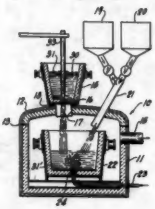
U.S. Cl. 75—49 **20 Claims**

1. A method of making steel comprising the steps of:

passing molten steel having excess amounts of carbon, sulfur hydrogen and oxygen from a first ladle to a second ladle disposed below the first ladle,

maintaining a vacuum pressure in the space between the ladles while the metal is being transferred between ladles, said Vacuum being sufficient for removing carbon and disolved gases from said metal,

terminating the metal transfer before any appreciable quantity of slag which may be disposed on the metal within the first ladle is permitted to flow through the second ladle,



adding a metallic substance to the metal in the second ladle, said substance being readily oxidizable in a highly exothermic chemical reaction,

blowing oxygen into said metal to oxidize the metallic substance thereby to elevate the temperature of the metal while continuing to deliver inert gas into the metal within the second ladle and maintaining vacuum pressure in said space,

discontinuing the blowing of oxygen and reducing the pressure in the space to a vacuum sufficient to degas the metal in the second ladle while continuing to deliver inert gas to the molten metal in the second ladle.

4,612,044

METHOD OF VACUUM TREATING METAL MELTS, AND VESSEL FOR USE IN THE METHOD

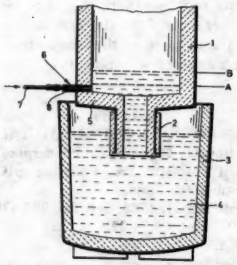
Horst Kutscher, and Gernot Zahs, both of Dortmund, Fed. Rep. of Germany, assignors to VACMETAL Gesellschaft für Vakuum-Metallurgie mbH, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 656,167, Sep. 28, 1984, abandoned. This application Jul. 30, 1985, Ser. No. 761,653

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335476

Int. Cl.[4] C21C 7/10

U.S. Cl. 75—49 **17 Claims**



1. A method of vacuum treating a metal melt, including a steel melt, contained in a ladle, comprising the steps of providing a vacuum syphon vessel having a bottom and a suction pipe extending therefrom, operating said vacuum syphon vessel with a reduced pressure in said vessel and with said suction pipe dipping into said laddle melt whereby a portion of said

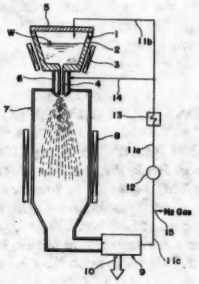
melt is drawn into said vacuum syphon vessel for treatment, and blowing oxygen surrounded by a protective medium substantially horizontally into said melt portion in said vacuum vessel directly above said bottom of said vessel.

4,612,045

METHOD FOR MAKING ALUMINUM NITRIDE POWDER

Yasuyuki Shintaku, Sennan, Japan, assignor to Chugai Ro Co., Ltd., Osaka, Japan

Filed Sep. 10, 1985, Ser. No. 774,448
Claims priority, application Japan, Sep. 10, 1984, 59-190246
Int. Cl.[4] C22B *21/00*
U.S. Cl. 75—68 R **3 Claims**



1. A process for making aluminum nitride powder which comprises the step of:

(a) melting metallic aluminum;

(b) atomizing the molten aluminum by high temperature N_2 gas into an N_2 atmosphere of not lower than 800° C., to thereby form atomized particles of aluminum nitride, and

(c) cooling the atomized particles of aluminum nitride to produce an aluminum nitride powder.

4,612,046

INSULATING AND SLAG INDUCING COMPOSITION AND METHOD FOR MOLTEN METAL CONTACT

Donald R. Orcutt, Hanover Park, Ill., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 10, 1985, Ser. No. 753,500
Int. Cl.[4] C22B *9/00*
U.S. Cl. 75—96 **3 Claims**

1. An insulating and slag inducing composition for molten metal contact comprising a mixture of Kaolite aggregate and amorphous quenched slag wherein the Kaolite aggregate has an approximate chemical analysis by weight of:

SiO_2	43.4%
Al_2O_3	38.0%
TiO_2	1.48%
Fe_2O_3	0.65%
CaO	15.8%
MgO	0.10%
Na_2O	0.03%
K_2O	0.33%

and the amorphous quenched slag has an approximate chemical analysis by weight of:

SiO_2	37.70%
Al_2O_3	9.76%
TiO_2	0.76%

-continued

Fe_2O_5	2.65%
CaO	46.0%
MgO	1.36%
Na_2O	0.33%
K_2O	0.42%
MnO	0.55%

4,612,047

PREPARATIONS OF RARE EARTH-IRON ALLOYS BY THERMITE REDUCTION

Frederick A. Schmidt; David T. Peterson, both of Ames, and John T. Wheelock, Nevada, all of Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 28, 1985, Ser. No. 791,972
Int. Cl.[4] C22C *33/00*
U.S. Cl. 420—83 **13 Claims**

1. An improved method for preparihg rare earth-iron alloys comprising:

mixing at least one rare earth fluoride with an iron fluoride to form a mixture, adding calcium metal to the mixture to form a reaction mixture, the amount of calcium being at least a stoichiometric amount necessary to completely reduce the fluorides to the metal, heating the reaction mixture in a sealed container under reducing conditions to a temperature sufficient to react the fluorides in the mixture with the calcium metal to form a metal alloy and a calcium fluoride slag, and separating the metal alloy for the slag thereby forming the rare earth-iron alloy.

4,612,048

DIMENSIONALLY STABLE POWDER METAL COMPOSITIONS

Randall M. German, Latham, N.Y.; Chaman Lall, Claymont, Del., and Deepak S. Madan, Troy, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 15, 1985, Ser. No. 754,741
Int. Cl.[4] C22C *29/00*
U.S. Cl. 75—246 **7 Claims**

1. A powder metal composition consisting essentially of about from 1 to 4 wt % nickel, about from 2 to 4 wt % molybdenum, about from 0.1 to 0.3 wt % boron, about from 0.1% to 0.2 wt % carbon, about from 0.1 to 0.2 wt % phosphorus and the balance iron.

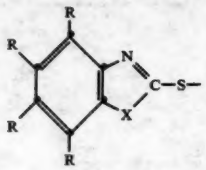
4,612,049

CORROSION-INHIBITING COATING COMPOSITIONS

Godwin Berner, Binningen, Switzerland; William Hoyle, and James Jack, both of Bramhall, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 610,147, May 14, 1984. This application Apr. 25, 1985, Ser. No. 727,046
Claims priority, application United Kingdom, May 14, 1983, 8313320
Int. Cl.[4] C04B *9/02*
U.S. Cl. 106—14.13 **22 Claims**

1. In a corrosion-inhibiting coating composition containing (a) a resinous film-forming binder and (b) a corrosion inhibitor, the improvement comprising, as the corrosion inhibitor (b), an effective amount of an aliphatic or cycloaliphatic mono-, di-, tri- or tetracarboxylic acid which is substituted in its aliphatic or cycloaliphatic radical by at least one group of the formula I



I

in which X is oxygen, sulfur or NH and each R independently of the others is hydrogen, alkyl, halogenoalkyl, alkoxy, alkylthio, alkylsulfonyl, cycloalkyl, phenyl, alkylphenyl, phenylalkyl, halogen, —CN, —NO_2, —COOH, —COOalkyl, —OH or a primary, secondary or tertiary amino or carbamoyl group, R not being —NH_2 in the case of a monocarboxylic acid in which X is sulfur, and base addition salts of said compounds.

4,612,050

SODIUM SILICATE COMPOSITION

Hamilton Hicks, 60 Butternut Hollow Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 552,869, Nov. 18, 1983, abandoned, which is a continuation of Ser. No. 392,766, Jun. 28, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,236

Int. Cl.[4] C09D *5/16*

U.S. Cl. 106—18.12 **3 Claims**

1. A liquid sodium silicate composition for application to wood for artifically petrifying the wood consisting of a liquid solution of sodium silicate dissolved in mineralized water and produced by mixing five pounds of a mineral-containing clay with five gallons of water, allowing the mixture to stand until the water leaches a substantial amount of minerals from the clay and thereafter separating the artificially mineralized water from the clay, mixing said separated water with about one-hundred gallons of naturally mineralized spring water combining said mixture of water with a solution of sodium silicate and acidifying with an acid solution having a pH of from 5.5 to 4 to an incipient gelling condition; wherein the composition, upon application to wood, penetrates, gels and fixes the minerals from the composition in the wood.

4,612,051

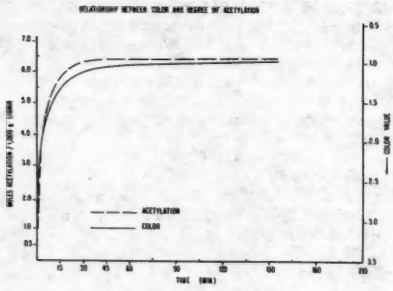
WATER-BASED PRINTING INK COMPOSITIONS CONTAINING A LIGNIN ACETATE BINDER

James E. Miller, Jr., Mt. Pleasant, and Peter Dilling, Isle of Palms, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,179

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—30 **5 Claims**



1. An improved water-based printing ink composition comprising, in aqueous medium, a colorant selected from the group consisting of a dispersed dye, a pigment, and mixtures thereof; and a water-insoluble non-sulfonated lignin acetate binder for the colorant.

4,612,052

FLEXOGRAPHIC INK COMPOSITION

Mark E. Schwartz, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 23, 1985, Ser. No. 693,994

Int. Cl.[4] C09D *11/12*

U.S. Cl. 106—31 **8 Claims**

1. Flexographic ink composition comprising from about 10 to about 30 percent by weight resinous binder, from about 5 to about 10 percent by weight coloring agent, from about 4 to about 7 percent by weight wax, from about 3 to about 12 percent by weight chlorinated polyolefin, and from about 55 to about 75 percent by weight solvent.

4,612,053

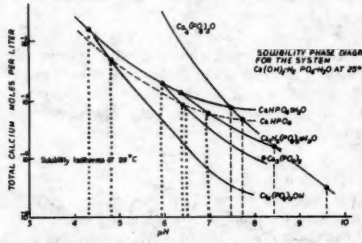
COMBINATIONS OF SPARINGLY SOLUBLE CALCIUM PHOSPHATES IN SLURRIES AND PASTES AS MINERALIZERS AND CEMENTS

Walter E. Brown, Rockville, and Laurence C. Chow, Germantown, both of Md., assignors to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 539,740, Oct. 6, 1983, Pat. No. 4,518,430, which is a continuation of Ser. No. 373,157, Apr. 29, 1982, abandoned. This application May 9, 1985, Ser. No. 732,515

Int. Cl.[4] C09K *3/00*

U.S. Cl. 706—35 **29 Claims**


SOLUBILITY PHASE DIAGRAM FOR THE SYSTEM Ca(OH)2-H3PO4-H2O AT 25°C
TOTAL CALCIUM MOLES PER LITER
pH
Solubility Isotherm at 25°C

1. A dental restorative slurry comprising an aqueous mixture of $Ca_4(PO_4)_2O$ and at least one other calcium phosphate selected from the group consisting of $CaHPO_4.2H_2O$, $CaHPO_4$, $Ca_8H_2(PO_4)_6.5H_2O$, α—$Ca_3(PO_4)_2$, β—$Ca_3(PO_4)_2$, and modified $Ca_3(PO_4)_2$, both calcium phosphates being present in the slurry in excess such that hydroxyapatite is substantially continuously precipitated from the slurry.

4,612,054

CARBODIIMIDE DRIERS FOR RESIN COATING COMPOSITIONS

Ray C. Hamon, Macon, Ga., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 18, 1985, Ser. No. 712,823

Int. Cl.[4] C09D *5/08, 3/64, 3/58, 3/54*

U.S. Cl. 106—264 **17 Claims**

1. A controllable drying-time, water-based or organic solvent-based alkyd composition which dries rapidly at ambient temperature without substantial evolution of gaseous by-products and is capable of application and flow on a solid substrate, comprising:

(A) about 0.1 to 40.0% by weight of a drying agent selected from the group comprising carbodiimides, polycarbodiimides and substituted polycarbodiimides;

(B) about 60 to 99.5% by weight of an organic carboxylate

selected from the group comprising alkyds, polyesters, acrylics, epoxides, phenolics, modified acrylics, modified vinyls and urethanes; said carboxylate being present in at least the stochiometric quantity required to react with said drying agent;

(C) about 0 to 90.0% by weight of a solvent selected from the group consisting of water, and organic solvents;

4,612,055
STABILIZED BLENDS OF THIOFUNCTIONAL POLYSILOXANE FLUIDS AND ORGANOPOLYSILOXANE FLUIDS AND A PROCESS FOR STABILIZING THE SAME

Paul A. Manis, Allentown, Pa.; Eugene R. Martin, Onsted, and Ronald L. Muntz, Adrian, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Apr. 10, 1985, Ser. No. 721,823
Int. Cl.⁴ C09D *1/00*
U.S. Cl. 106—287.11 **19 Claims**

1. A stabilized composition comprising a blend of a thiofunctional polysiloxane fluid having units of the formula

$$(R'SR'')_b\overset{R_a}{\underset{|}{SiO}}\frac{4-(a+b)}{2}$$

where R is selected from the group consisting of a monovalent hydrocarbon radical having from 1 to 18 carbon atoms and a halogenated monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R' is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R'' is selected from the group consisting of a divalent hydrocarbon radical free of aliphatic unsaturation having from 2 to 28 carbon atoms, a hydrocarbon ether radical and a hydrocarbon thioether radical in which R'' is bonded to the silicon atom via a silicon carbon bond, a is a number of from 0 to 2, b is a number of from 1 to 3 and the sum of a+b is equal to at least 2, and an organopolysiloxane fluid having the formula

$$\left(\begin{array}{c} R \\ | \\ -SiO- \\ | \\ R \end{array}\right)_x$$

where R is selected from the group consisting of a monovalent hydrocarbon radical having from 1 to 18 carbon atoms and a halogenated monovalent hydrocarbon radical having from 1 to 18 carbon atoms and the terminal groups are selected from the group consisting of triorganosiloxy, alkoxy and hydroxy groups and x is a number greater than 8 and an amine containing compound selected from the group consisting of an organic amine, an aminofunctional silane and an aminofunctional siloxane, in an amount of from 0.001 to 10 percent by weight based on the weight of the amine containing compound and the blend containing the thiofunctional polysiloxane fluid and the organopolysiloxane fluid.

4,612,056
METHOD AND DEVICE FOR PLATFORM ENCRUSTATION ERADICATION

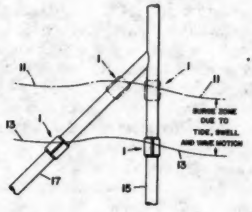
James B. Gibson, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 30, 1984, Ser. No. 676,703
Int. Cl.⁴ B08D *7/04*
U.S. Cl. 134—6 **2 Claims**

1. A method of reducing marine growth in the splash zone on a platform member, comprising:

placing an outer buoyant jacket around an inner, weighted, low friction sleeve;

slidably positioning said inner sleeve and said outer jacket around a platform member that is susceptible to encrustation by marine growth in a substantially close fit so that the inner sleeve may move along the member in response



to tidal and surge action while still scraping the member enough to reduce the attachment of marine organisms; and

adjusting the size and buoyancy of the inner sleeve and outer jacket so that the platform member is scraped in the area vulnerable to marine growth.

4,612,057
RECOVERY OF SILVER FROM PHOTOGRAPHIC FILMS BY HIGH SHEAR CONDITIONS

Kenneth R. Buser, Wilmington, Del., and Thomas A. Rettig, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 22, 1985, Ser. No. 693,252
Int. Cl.⁴ B08B *7/04*
U.S. Cl. 134—13 **6 Claims**

1. A process for the recovery of silver from photographic film having a polyester base and a surface coating which provides adhesion for a silver emulsion layer which comprises:

mixing pieces of the photographic film, ranging in size from about 2 to about 20 millimeters in the longest dimension, with water heated to a temperature between about 140° F. and 200° F. wherein the resulting mixture has a solids concentration level of at least 25 percent by volume,

subjecting the mixture to conditions of high shear of an intensity and for a period sufficient to leave less than about 6 parts per million of silver on the pieces, rinsing the film pieces with additional hot water after the mixture has been subjected to the conditions of high shear, and

separating the aqueous liquid containing the removed silver emulsion from the film pieces and recovering the silver from the liquid.

4,612,058
COMPOSITIONS FOR REMOVING POLYMERIC FILMS

Juergen Geke, and Dieter Meyer, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 607,331, May 4, 1984, abandoned. This application Jul. 19, 1985, Ser. No. 756,937
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316876
Int. Cl.⁴ C09D *9/00, 9/04;* C11D *3/30, 7/32*
U.S. Cl. 134—38 **7 Claims**

1. A method for removing a temporary film-forming polymeric protective coating applied for protection during transport and storage from an automobile body, wherein the temporary film-forming polymeric protective coating is a polymer or copolymer of methacrylic acid, acrylic acid, esters of methacrylic or acrylic acid, acrylamide, maleic acid or diesters thereof, vinyl acetate, vinyl butyrate, or vinyl chloride which

was applied from an aqueous dispersion or emulsion, consisting essentially of the steps of

(I) contacting said film-forming polymeric protective coating with a liquid aqueous composition having a pH of about 9.5 or lower consisting essentially of:

(a) from about 3 to about 30 wt. %, based on the weight of the total composition, of an amine containing two or three hydroxyalkyl substituents, said hydroxyalkyl substituents containing from 1 to 4 C-atoms; and

(b) from about 0.3 to about 15 wt. %, based on the weight of the total composition, of at least one hydrotropic substance wherein said at least one hydrotropic substance is selected from the following:

(i) a monoalkyl ether of a di, tri or tetraethylene or propylene glycol, the alkyl in said monoalkyl moiety containing from 1 to 4 C-atoms,

(ii) an alkaryl or lignin sulfonate,

(iii) an ether sulfate of a monohydric alcohol containing from 10 to 20 C-atoms,

(iv) a salt of a C_{16}–C_{24} fatty acid,

(v) urea, and

(vi) a water-soluble, anionic, non-ionic or cationic polymeric substance selected from the group consisting of a polycarboxylic acid, a polyglycol ether, a polyvinyl alcohol, a polysaccharide derivative and a protonated or methylated polyethylene imine; and

wherein to the extent any of the above may be considered as solvents, the composition is free from any other solvents; and

II. removing any adhering dissolved polymer residue with water.

4,612,059

METHOD OF PRODUCING A COMPOSITE MATERIAL COMPOSED OF A MATRIX AND AN AMORPHOUS MATERIAL

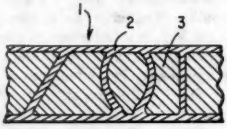
Hirotaro Mori, Suita, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Jul. 5, 1984, Ser. No. 627,679

Claims priority, application Japan, Jul. 12, 1983, 58-125549

Int. Cl.[4] C22F *3/00*

U.S. Cl. 148—4 **11 Claims**



1. A method of producing a composite material comprising the steps of

positioning an intermetallic starting material at a predetermined position in a matrix, which position is at least one of within the matrix and on a surface of the matrix, said starting material consisting of at least one intermetallic compound and being in the form of crystals which are transformable into an amorphous state while remaining in a solid state; and

irradiating said starting material with an electron beam for at least 60 seconds to cause a solid state transformation thereof preferentially to said amorphous state, the resulting composite material having an interface between said matrix and the material in said amorphous state which is obtained by diffusion conjunction.

4,612,060

PROCESS FOR CONTROLLING ZINC PHOSPHATE TREATING SOLUTIONS

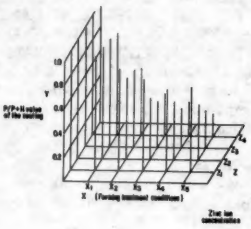
Ryuiji Kojima; Naomi Suzuki; Yokichi Sato, all of Tokyo, and Tsuneo Saito, Kanagawa, all of Japan, assignors to Parker Chemical Company, Madison Heights, Mich.

Filed Feb. 25, 1985, Ser. No. 704,819

Claims priority, application Japan, Feb. 29, 1984, 59-37670

Int. Cl.[4] C23C *22/12*

U.S. Cl. 148—6.15 Z **4 Claims**



1. A process for controlling the content of zinc plus nickel of a zinc phosphate bath, comprising:

(1) obtaining a bath sample of known volume;

(2) adding a quantity of ethylene diamine tetraacetic acid (EDTA), in the form of an aqueous solution, in a predetermined amount sufficient to yield an excess of EDTA over that required to complex the zinc and nickel present;

(3) adding a buffering solution;

(4) titrating the resulting solution by the addition of an aqueous calcium solution in the presence of a calcium ion electrode to the end point indicated by maximum rate of change of the electrode value whereby the content of zinc plus nickel is determined; and

(5) making additions to the bath to control zinc and nickel at the desired level.

4,612,061

METHOD OF MANUFACTURING PICTURE TUBE SHADOW MASK

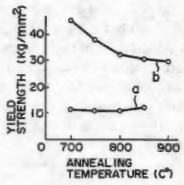
Fumio Suzuki, Saitama; Makoto Fujinuma; Yasuhisa Ohtake, both of Fukaya, and Michihiko Inaba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1985, Ser. No. 710,979

Claims priority, application Japan, Mar. 15, 1984, 59-48145; Mar. 15, 1984, 59-48147

Int. Cl.[4] C23C *8/10*

U.S. Cl. 148—6.35 **5 Claims**



1. A method of manufacturing a picture tube shadow mask, comprising the steps of forming a plurality of mask apertures in a thin metal plate having iron and nickel as major constituents, annealing the metal plate with the plurality of mask apertures, the annealing being performed at a temperature of not lower than 1,000° C. at a vacuum pressure of not higher than 10^{-1} torr, hydrogen gas being continuously supplied to provide a

reducing atmosphere, and forming a darkened oxide layer on the annealed metal plate, wherein cooling after annealing is performed in a reducing atmosphere, and the darkened oxide layer is formed at first in a weak oxidizing steam atmosphere and then in a strong oxidizing steam atmosphere.

4,612,062

PROCESS FOR PRODUCING A FINE-GRAINED WORKPIECE FROM A NICKEL-BASED SUPERALLOY

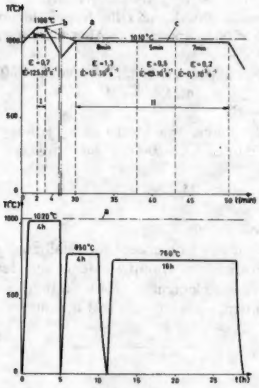
Mohamed Y. Nazmy, Gebenstorf; Hans Rydstad; Günther Schröder, both of Birmenstorf, and Robert Singer, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Sep. 28, 1984, Ser. No. 655,551

Claims priority, application Switzerland, Sep. 28, 1983, 5252/83

Int. Cl.⁴ C22F *1/10*

U.S. Cl. 148—11.5 N **6 Claims**



1. Process for producing a fine-grained workpiece, having improved mechanical properties, from a nickel-based suoeralloy, characterised in that, in a first step, a forging blank is converted into an intermediate form by isothermal forging above the solution-annealing temperature for the γ'-phase, a degree of deformation ϵ of at least 0.7 and a deformation rate $\dot{\epsilon}$ of $5\times10^{-3}s^{-1}$ to $15\times10^{-3}s^{-1}$ being maintained, and that the intermediate form is, in a second step, converted into the final form by isothermal forging just below the solution-annealing temperature for the γ'-phase, using a deformation rate $\dot{\epsilon}$ of $2\times10^{-3}s^{-1}$ to $0.1\times10^{-3}s^{-1}$, ϵ being defined as follows:

$$\dot{\epsilon} = \frac{d\left[\left|\ln\frac{A_o}{A_f}\right|\right]}{dt},$$

A_o=Cross-sectional area of the workpiece before forming, for each step,

A_f=Cross-sectional area of the workpiece after forming,

ln=Natural logarithm

t=Time in seconds.

4,612,063

METHOD OF MAKING A FENCE STRETCHER BAR

Russell E. Thedford, deceased, late of Norman, Okla. (by Russell E. Thedford, executor), assignor to Acme Fence and Iron Company, Inc., Norman, Okla.

Filed Jul. 13, 1984, Ser. No. 630,386

Int. Cl.⁴ C21D *8/06*

U.S. Cl. 148—12 B **33 Claims**

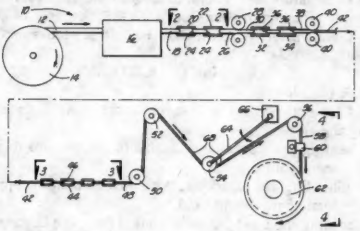
15. A method of making galvanized flat bar comprising the steps of:

cleaning an outer surface of a continuously fed round rod;

cold-rolling and straightening said round rod into a continuously fed flat bar;

annealing said flat bar;

galvanizing said flat bar;



straightening said flat bar;

cutting said flat bar into a plurality of members of predetermined length, each of said members having two cut ends substantially perpendicular to a longitudinal axis of said member; and

flame-spray coating said cut ends of said members with zinc.

4,612,064

METHOD FOR HEAT-TREATING A CHARGE USING A VACUUM FURNACE

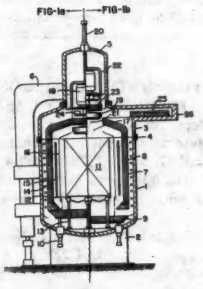
Peter Schmetz, Menden, Fed. Rep. of Germany, assignor to Schmetz GmbH, Menden, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 731,058

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416902

Int. Cl.⁴ C21D *1/74*

U.S. Cl. 148—13 **3 Claims**



1. A method of heat-treating a charge in a vessel which can be closed off and evacuated, said method comprising the steps of:

placing said charge in said vessel;

evacuating said vessel;

thereupon flooding said vessel with inert gas;

then convectively heating said charge in a first heating step in lower temperature range via heating and gas circulation, to a maximum limit of approximately 750° C. within operating temperature range of a heating gas circulation device; and

thereafter radiation heating said charge in a second heating step in upper temperature range, to a predetermined end temperature of the heat-treatment of approximately 1150° C., essentially by radiant heat.

4,612,065
METHOD FOR THE HEAT TREATMENT OF WORKPIECES

Friedhelm Kühn, Mülheim, Fed. Rep. of Germany, assignor to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 521,846, Aug. 10, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,656
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230531
Int. Cl.[4] C21D *1/18*
U.S. Cl. 148—16 **16 Claims**

1. A method for the heat treatment of workpieces, comprising the steps of:

heating the workpieces in a heating apparatus to an elevated temperature,

unloading the workpieces from the heating apparatus for further treatment, and

cooling the workpieces unloaded from the heating apparatus to a temperature decidedly lower than the elevated temperature,

said cooling step including:

placing the workpieces for cooling into a fluidized bed which is produced by at least one gas stream guided in a main flow direction, the fluidized bed comprising a medium of particles which have a higher thermal conductivity than the material of the workpieces being cooled, thereby providing a steep thermal gradient,

producing a turbulent, mixing motion of the particles in the bed adjacent to the workpiece whereby substantially all surfaces of the workpieces, including a downwind facing surface thereof, are contacted by bed particles which are undergoing a moving, mixing motion, said step of providing turbulent, mixing motion including:

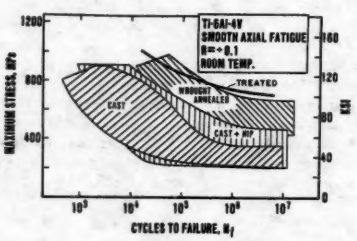
moving the workpieces during cooling relative to the gas stream producing the fluidized bed, while in addition to said relative movement injecting a plurality of individual, pulsed gas jets into the fluidized bed at substantially right angles to the main direction of flow of the gas steam and directed toward the workpieces, said moving and injecting steps providing a continuous exchange of particles of said medium at all surfaces of the workpieces during cooling, and

holding the fluidized bed at a substantially constant temperature during cooling of the workpieces in the fluidized bed.

4,612,066
METHOD FOR REFINING MICROSTRUCTURES OF TITANIUM ALLOY CASTINGS

Lev Levin, Department of Materials Engineering, Technion-Israel Institute of Technology, Technion City, Haifa 32000, Israel; Russell G. Vogt, 1373 Meadow Bridge Dr., Dayton, Ohio 45432; Daniel Eylon, 7245 Fontella Ct., Dayton, Ohio 45415, and Francis H. Froes, 1139 Brewster Dr., Xenia, Ohio 45385

Filed Jul. 25, 1985, Ser. No. 758,929
Int. Cl.[4] C22F *1/18*
U.S. Cl. 148—20.3 **7 Claims**



1. A method for improving the microstructure of a cast titanium alloy article which comprises, in combination, the steps of:

a. beta-solution heat treating said article at a temperature approximately equal to the beta-transus temperature of said alloy;

b. cooling said article at a rate in excess of air cooling to room temperature;

c. hydrogenating said article at a temperature in the approximate range of 50 to 96% of said beta-transus temperature; and

d. dehydrogenation said article at a temperature in the approximate range of 50 to 96% of said beta-transus temperature.

4,612,067
MANGANESE STEEL

Hugo R. Larson, Mahwah, and Dilip K. Subramanyam, Pompton Lakes, both of N.J., assignors to Abex Corporation, Stamford, Conn.

Filed May 21, 1985, Ser. No. 736,307
Int. Cl.[4] C22C *38/04*
U.S. Cl. 148—329 **2 Claims**

1. Austenitic manganese steel casting solutionized by heat treatment at about 1900°-2000° F. and in weight percent consisting of

Manganese: about 25

Carbon: about 1.5

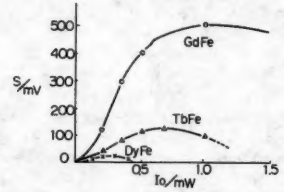
Silicon: about 0.1 to 1

balance essentially iron except for small amounts of impurities, deoxidizers or tramp elements and devoid of intentionally added elements to form carbides including those of chromium, molybdenum and titanium.

4,612,068
MAGNETO-OPTICAL RECORDING MEDIUM

Shinsuke Tanaka, Kanagawa, and Nobutake Imamura, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,538
Claims priority, application Japan, Mar. 29, 1983, 58-051508
Int. Cl.[4] C22C *38/00*
U.S. Cl. 148—301 **5 Claims**



1. A magneto-optical recording medium using an amorphous thin film having an easy magnetization axis perpendicular to the film surface, wherein the chemical formula of said medium is:

$$(Sm_zA_{1-z})_xFe_{1-x}$$

where A is a heavy rare earth element, and wherein the following atom ratio is satisfied:

$$0.15 \leqq x \leqq 0.35,\ 0.06 < z < 0.31.$$

4,612,069

PITTING RESISTANT DUPLEX STAINLESS STEEL ALLOY

Charles W. Rainger, Huron; Allan P. Castillo, Castalia, and John C. Rogers, Sandusky, all of Ohio, assignors to Sandusky Foundry & Machine Company, Sandusky, Ohio

Filed Aug. 6, 1984, Ser. No. 637,892
Int. Cl.[4] C22C 38/42
U.S. Cl. 148—325 2 Claims

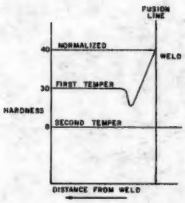
1. A highly pitting resistant ferritic-austenitic duplex cast stainless steel alloy which has been very slowly furnace-control-cooled from the solution annealing temperature such that harmful tensile residual stresses are minimized while retaining excellent ductility and corrosion resistance and consisting of, in weight percentages; C: 0.03% and below; Si: 0.7% and below; Mn: 1.0% and below; Cr: 25.0% to 27.0%; Ni: % 5.0 to 7.5%; Cu: 1.5% to 3.5%; N: 0.15% and below; Mo: 0.5% and below; and the remaining portion Fe and unavoidable impurities.

4,612,070

METHOD FOR WELDING CHROMIUM MOLYBDENUM STEELS

Vinod K. Sikka, Clinton, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,605
Int. Cl.[4] C21D 9/50
U.S. Cl. 148—127 2 Claims



1. A process for welding chromium-molybdenum steels comprising:

subjecting said steel to normalization by heating to above the transformation temperature and cooling in air;

subjecting said steel to a partial temper by heating to a temperature less than a full temper;

welding said steel using an appropriate filler metal;

subjecting said steel to a full temper by heating to a temperature sufficient to optimize strength, reduce stress, increase ductility and reduce hardness.

4,612,071

MECHANICAL STRESS IMPROVEMENT PROCESS

William J. O'Donnell, Bethel Park, and Jan S. Porowski, Pittsburgh, both of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 582,617, Feb. 22, 1984. This application Apr. 1, 1985, Ser. No. 718,439
Int. Cl.[4] C21D 8/00
U.S. Cl. 148—131 3 Claims

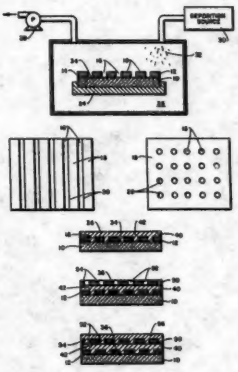
1. A process for reducing the residual welding stresses in the weld metal, heat-affected zone and in the adjacent base metal of steel piping that have been butt-welded to each other end-to-end by means of a circumferential weld which comprises mechanically introducing comprises stresses in said weld metal, heat-affected zone and adjacent base metal higher than their individual yield strengths in compression in an amount sufficient to permanently reduce the diameter of the resulting pipe in the weld metal, heat-affected zone and the adjacent base metal above about 0.2 percent but below one percent using ring means split in the circumferential direction and forced by outside means to obtain said permanent reduction in diameter.

4,612,072

METHOD FOR GROWING LOW DEFECT, HIGH PURITY CRYSTALLINE LAYERS UTILIZING LATERAL OVERGROWTH OF A PATTERNED MASK

Andrew D. Morrison, Altadena, and Taher Daud, LaCrescenta, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 507,624, Jun. 24, 1983, Pat. No. 4,522,661. This application Feb. 28, 1985, Ser. No. 706,564
Int. Cl.[4] H01L 21/20, 21/76
U.S. Cl. 148—175 7 Claims



1. A method of forming an improved semiconductor comprising the steps of:

applying to a surface of a semiconductor a layer of a first mask having a pattern of openings exposing portions of the surface, said mask being impervious to diffusion of impurities from said surface;

growing a first continuous layer of semiconductor on said surface extending from exposed portions and bridging the connecting portions of the mask to form a continuous layer;

applying to a surface of said first layer of semiconductor a second mask having a pattern of openings in registration with the bridges between the openings of the first mask and a pattern of bridges overlying the openings in the first mask, and

growing a second continuous layer of semiconductor on said first layer with the second layer extending from the openings in the second mask over the bridges of the second mask.

4,612,073

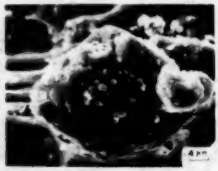
ALUMINUM GRAIN REFINER CONTAINING DUPLEX CRYSTALS

Matthew M. Guzowski, Wernersville; David A. Sentner, Pottstown, and Geoffrey K. Sigworth, Reading, all of Pa., assignors to Cabot Corporation, Boston, Mass.

Filed Aug. 2, 1984, Ser. No. 637,174
Int. Cl.[4] C22C 21/00
U.S. Cl. 148—415 2 Claims

1. A grain refiner that contains more than 5% duplex crystals obtained by producing aluminide crystals containing boron in solution, and aging said aluminide crystals for a sufficient time and temperature to precipitate at least part of the boron to

form said duplex crystals having a structure of $(Ti+B)Al_3$ said grain refiner consisting essentially of, in weight percent, 0.5 to



2000X

5 boron, 2 to 12 percent titanium and the balance aluminum plus normal impurities.

4,612,074

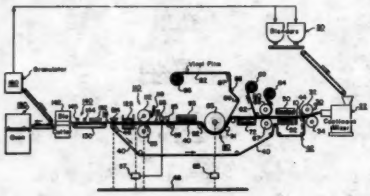
METHOD FOR MANUFACTURING A PRINTED AND EMBOSSED FLOOR COVERING

Merrill M. Smith, Morrisville, Pa., and Donald C. Ferguson, Trenton, N.J., assignors to American Biltrite Inc., Wellesley Hills, Mass.

Continuation of Ser. No. 525,892, Aug. 24, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 805,587

Int. Cl.[4] B32B *31/00*; B29B *1/16*; B31F *1/00*; B29C *59/00*

U.S. Cl. 156—85 **8 Claims**



1. A method of making, on a continuous basis, a composite vinyl tile comprising the steps of:

forming a continuous base web on a continuously moving supported surface traveling in a substantially horizontal direction, said web being formed from a vinyl composition, said moving surface being made of a material such that the base web will adhere to the surface when the web is hot but can be removed from it when the web is cooled,

heating said base web,

transferring a printed design from a pre-printed stable carrier sheet to a surface of the heated continuous base web, said printed design being formed by a vinyl material compatible with said base web, said printed design including a first portion which constitutes a decorative design for the composite vinyl tile and a second portion which provides registration indicia for use in manufacturing thereof,

laminating a clear plastic wear layer over the printed design on the base web,

after the base web is laminated, aligning the web by means of the printed registration indica so that the web is aligned with an embossing roll in both a direction transverse to the direction of travel of the web and a direction that is the same as the direction of travel of the web,

mechanically embossing the printed surface of the base web with depressions in registration with the printed decorative design,

after the base web is embossed, cooling the base web,

stripping the cooled web from the moving surface,

after stripping the base web from the moving surface, aligning the web by means of the printed registration indicia so that the web is aligned with a cutting tool in both the direction transverse to the direction of travel of the web and the direction that is the same as the direction of travel of the web,

after aligning the web, cutting the base web into discrete tiles so that the decorative design is in register with the edges of the tiles, and

after cutting the base web into discrete tiles, annealing the cut tiles,

characterized by the step of continuously controlling the speed of the continuously moving base web in the laminating step relative to the speed of the continuously moving base web in the embossing step in order to maintain proper web tension so that the web does not expand laterally in the direction transverse to the direction of travel of the web or stretch in the same direction as the direction of travel of the web.

4,612,075

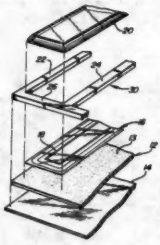
SUBSTRATELESS TRIM STRIP AND METHOD OF MAKING

Robert E. Waugh, Sun City Center, Fla.; Urban R. Nannig, North Kingstown, R.I., and Clyde R. Rockwood, Columbus, Ohio, assignors to The D. L. Auld Company, Columbus, Ohio

Filed Jun. 12, 1985, Ser. No. 744,014

Int. Cl.[4] B60R *13/04*

U.S. Cl. 156—242 **16 Claims**



1. A method of making a substrateless trim strip comprising the steps of:

(a) providing an elongate layer of pressure sensitive adhesive,

(b) forming spaced, elongate raised boundaries on a first surface of said layer of pressure sensitive adhesive to provide at least one open area running lengthwise on said elongate layer of pressure sensitive adhesive,

(c) treating said first surface of pressure sensitive adhesive within said open area to render said first surface tack free and suitable for printing directly on the treated surface,

(d) decorating said treated surface by printing indicia directly thereon,

(e) casting a curable liquid plastic resin onto said treated surface so that it flows to the edges of said plurality of elongate raised boundaries, filling the area there between, and

(f) curing said resin to harden it and provide a substrateless trim strip having a plastic lens cap.

4,612,076

LABEL LAMINATING METHOD

James A. Moss, Huntington Beach, Calif., assignor to Willett International Limited, Slough, England

Filed Nov. 19, 1984, Ser. No. 673,084

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—249 **8 Claims**

1. A method of laminating a label on a surface of an article, comprising the steps of:

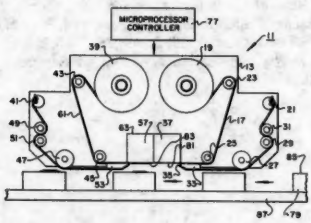
supplying a pressure sensitive label from a label dispenser to a receiving face of a label applying station, the label apply-

ing station having gas passage means which open at the receiving face;

supplying a piece of transparent laminate material to a receiving face of a laminate applying station, the laminate applying station having gas passage means which open at the receiving face;

releasably retaining the pressure sensitive label at the label applying station and the laminate material at the laminate applying station by applying reduced pressure through the gas passage means to the receiving faces of the respective stations;

moving the article to be labeled past the label applying station;



applying a blast of gas through the passage means of the label receiving face and against the label on the label receiving face of the label receiver to remove the label from the label receiving face and to transfer the label to the surface of the article;

continuing to move the article past a laminate applying station; and

applying a blast of gas through the passage means of the laminate receiving face and against the laminate material on the laminate receiving surface to remove the laminate material from the laminate receiving face and to transfer the laminate material to the surface of the moving article to laminate the previously applied label.

4,612,077

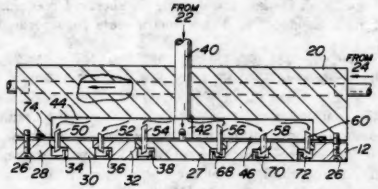
ELECTRODE FOR PLASMA ETCHING SYSTEM

David H. Tracy, Norwalk, Conn., and Donald L. Smith, Palo Alto, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 29, 1985, Ser. No. 759,819

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—345 **7 Claims**



1. An electrode for plasma etching including a source of process gas to be delivered to a reactor etching chamber comprising:

(a) a plurality of concentric rings surrounding a center disc and disposed to rest inside each other;

(b) said rings and said disc forming annular plenum chambers therebetween; and said rings and disc further providing a plurality of openings therein leading from said source of process gas to said plenums; and

(c) said rings being spaced to provide annular slits therebetween for transferring gas from said plenums into said reactor etching chamber.

4,612,078

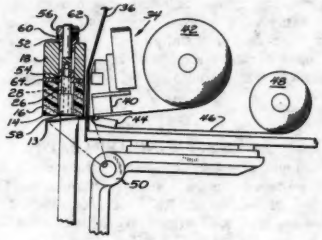
AUTOMATED ONE-STROKE LABEL APPLICATOR

Edward C. Karp, Belvidere, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.

Filed Sep. 12, 1984, Ser. No. 649,618

Int. Cl.[4] B44C *1/00;* **B32B** *13/00;* **B65H** *31/00;* **B23K** *27/00*

U.S. Cl. 156—493 **9 Claims**



1. A label applicator for applying printed adhesive backed labels from a label pick-up station to a commodity wherein the printed label is presented in cantilever extension from the pick-up station, said label applicator comprising a vacuum assisted pick-up and applicator head adapted to be positioned closely above the non-adhesive side of a label adjacent the pick-up station to seize at least a portion of an extended label by its non-adhesive side, and means to move said pick-up and applicator head downwardly to apply the label to the commodity and to release the label from said pick-up and applicator head, said pick-up and applicator head being a composite structure including a slideably, vertically mounted rigid member to apply an initial impact force for engaging said label against the commodity and a conformable, elastomeric applicator for applying an even, uniform final applicating pressure to said label against the commodity.

4,612,079

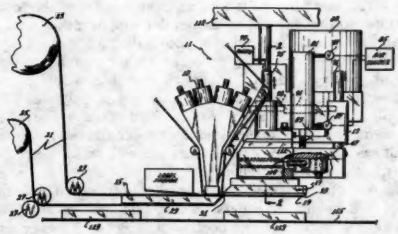
LABEL APPLICATOR WITH PIVOTABLE LABELING HEAD

Robert L. Ostrow, Santa Ana, Calif., assignor to Label-Aire, Inc., Fullerton, Calif.

Filed Jul. 25, 1984, Ser. No. 634,465

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—497 **13 Claims**



1. A label applicator for labeling an article at a label applying station, said label applicator comprising:

a supporting structure;

a movable label receiver;

means for mounting the label receiver on the supporting structure for movement along a path between a label

dispensing station and the label applying station and for rotational movement about an axis to control the angular orientation of the label relative to the article at the label applying station;

label dispensing means for moving a label onto the label receiver at the label dispensing station;

means for releasably retaining the label on the label receiver;

means for moving the label receiver along said path between said stations;

means for rotating the label receiver about said axis whereby the label can be transferred to the article at the label applying station in the desired angular orientation; and

said rotating means including a motor on the supporting structure which does not move with the label receiver to the label applying station and means for drivingly coupling the motor and label receiver whereby the label receiver can be rotated.

4,612,080

WEB SPLICING APPARATUS

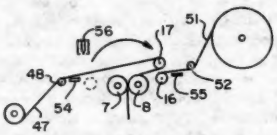
Franco Aisola, Bologna, and Renato Piccinini, Sala Bolognese, both of Italy, assignors to ACMA, Farmington, Conn.

Filed Apr. 11, 1984, Ser. No. 598,953

Claims priority, application Italy, May 3, 1983, 3407 A/83

Int. Cl.⁴ B65H *19/08*

U.S. Cl. 156—504 **5 Claims**



1. An apparatus for splicing the trailing end of an old web of a reel about to run out and the leading end of a new web of a new reel, comprising:

(a) a frame having two reels, each reel mounted on opposite sides of said frame; said reels each adapted to carry webs;

(b) a pair of generally tangential rollers each mounted on a fixed axis on said frame and between which the web is fed;

(c) a pair of opposed coaxial bushings mounted on said frame on an axis substantially tangential to the plane of said pair of tangential rollers;

(d) a pair of rocker arms pivotally mounted on said bushings and having end portions extending outwardly from said bushings;

(e) each of said pair of rocker arms having an idler roller mounted on one end portion thereof on an axis substantially tangential to the plane of said pair of tangential rollers, said idler rollers being positioned one above the other so that the upper idler roller supports the old web and the lower idler roller supports the new web;

(f) said rocker arms being pivotal together from a first position placing said idler rollers on one side of said pair of tangential rollers to a second position placing said idler rollers on the opposite side of said pair of tangential rollers so that the upper one of said idler roller and the lower one of said idler roller can support the web from the reel at either end of said frame;

(g) a pair of lock means mounted on said frame on each side of said tangential rollers, one of said lock means being engageable with an end portion of one of said rocker arms when said rocker arms are in said first position and the other of said lock means being engageable with an end portion of the other of said rocker arms when said rocker arms are in said second position to restrain upward movement of the upper one of said idler rollers;

(h) a pair of cam means pivotally mounted on said frame on each side of said pair of rollers; one of said cam means being engageable with an end portion of one of said rocker arms when said rocker arms are in said first position and the other of said cam means being engageable with an end portion of the other of said rocker arms when said rocker arms are in said second position;

(i) said cam means being operable to pivot said rocker arms to raise the lower one of said idler rollers so that the new web supported thereon can be pressed against the old web on the upper one of said idler rollers.

4,612,081

PRESSURE EQUALIZING PAD FOR HEATED PLATE PRESSES

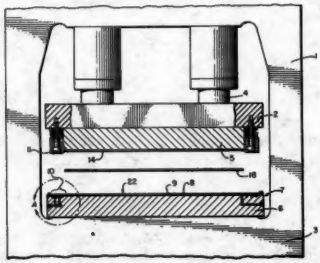
Rolf Kasper, Leimen, and Friedrich B. Bielfeldt, Eppingen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,220

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429801

Int. Cl.⁴ B29C *3/00*

U.S. Cl. 156—583.1 **11 Claims**



1. A pressure equalizing pad for heated plate presses and the like, comprising:

(a) a press stand having a movable ram thereon;

(b) a stationary press bed on said stand;

(c) an upper pressure plate attached to said ram, and a bed-pressure plate positioned on said press bed; and

(d) a hydrostatic pressure pad positioned on said bed-pressure plate.

4,612,082

ARSENIC CELL STABILIZATION VALVE FOR GALLIUM ARSENIDE IN-SITU COMPOUNDING

Glenn H. Westphal, Dallas, and Jimmie B. Sherer, Greenville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 446,298, Dec. 2, 1982, Pat. No. 4,522,791. This application Feb. 13, 1985, Ser. No. 701,589

Int. Cl.⁴ C30B *15/00*

U.S. Cl. 156—607 **4 Claims**

1. A method of growing single crystals of a compound semiconductor, wherein one element of said compound semiconductor is more volatile and wherein another element of said compound semiconductor is less volatile, comprising the steps of:

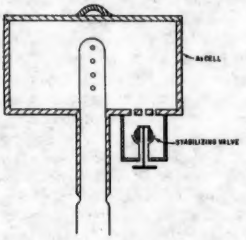
measuring a predetermined amount of said less volatile element into a crucible, a sublimation cell including a vapor injection tube downwardly extending from said sublimation cell;

measuring a predetermined amount of said more volatile element into said sublimation cell, said respective predetermined amounts being selected to achieve a desired ratio of said volatile element to said nonvolatile element in a melt;

heating said crucible, to melt said less volatile element;

immersing said injection tube in said melt of said less volatile element; and

heating said sublimation cell, so that said volatile element passes into said melt in the vapor phase and is compounded with said less volatile element in said melt;



wherein said sublimation cell further comprises a check valve connected to prevent the interior of said sublimation cell from having a lower pressure than the exterior of said sublimation cell.

4,612,083

PROCESS OF FABRICATING THREE-DIMENSIONAL SEMICONDUCTOR DEVICE

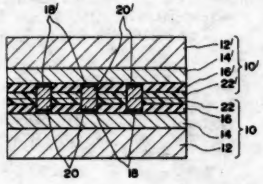
Masaaki Yasumoto; Hiroshi Hayama, and Tadayoshi Enomoto, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,987

Claims priority, application Japan, Jul. 20, 1984, 59-150598

Int. Cl.[4] B44C *1/22*; B29C *17/08*; C09J *5/02*; C23F *1/02*

U.S. Cl. 156—633 **15 Claims**



1. A process of fabricating a three-dimensional semiconductor device, comprising the steps of

(1) preparing at least two semiconductor structures each including at least one semiconductor element and a conductor electrically connected at one end to said semiconductor element and having at the other end thereof an exposed surface portion, at least one of said semiconductor structures further including a thermally fusible insulating adhesive layer having a surface substantially coplanar with said exposed surface of said conductor,

(2) positioning said semiconductor structures with respect to each other so that the exposed surface portions of the respective conductors of the semiconductor structures are spaced apart from and substantially aligned with each other,

(3) moving at least one of said semiconductor structures with respect to the other until the exposed surface portions of the respective conductors of the semiconductor structures are brought into contact with each other, and

(4) heating the semiconductor structures for causing said insulating adhesive layer of at least one of said semiconductor structures to thermally fuse to the other semiconductor structure with said semiconductor elements electrically connected together.

4,612,084

METHOD FOR TREATING THE EDGES OF A SAWTOOTH WIRE FOR THE CARD CLOTHING OF TEXTILE MACHINES

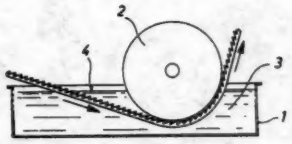
Karl-Heinz Schmolke, Neuweiler, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,560

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1983, 3332804

Int. Cl.[4] C23F *1/02*; B44C *1/22*

U.S. Cl. 156—639 **9 Claims**



1. A method of reducing the adherence of fibers to the teeth of sawtooth wire in textile machinery by treating edges of the teeth in a manner that sharp edge of the teeth are rounded wherein the improvement comprises treating the teeth of said sawtooth wire by subjecting said sawtooth wire to a chemical deburring bath wherein sharp edges of said teeth are rounded by chemical deburring.

4,612,085

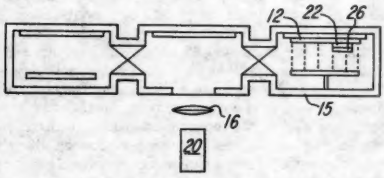
PHOTOCHEMICAL PATTERNING

Edward C. Jelks, Dallas, Tex., and Michael R. Melloch, West Layfayette, Ind., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 10, 1985, Ser. No. 722,250

Int. Cl.[4] B44C *1/22*; C03C *15/00*; C23F *1/02*; B29C *17/08*

U.S. Cl. 156—643 **11 Claims**



1. A method of forming a mask of a first material on a selected region on a surface of a substrate, comprising the steps of:

(a) introducing a gas over said surface, said gas characterized by photodecomposition into said first material plus volatile other material; and

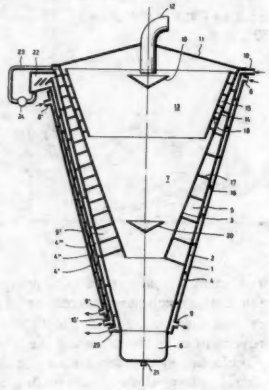
(b) illuminating said surface only at said selected region, whereby said gas decomposes and deposits said first material on said selected region and forms said mask.

4,612,086

EVAPORATORS

Aurelio D. Dominguez, Godoy Cruz, Argentina, assignor to Inquimet Sociedad Anonima Industrial Comercial y Agraria, Argentina

Filed May 10, 1985, Ser. No. 733,140
Claims priority, application Argentina, May 11, 1984, 296637
Int. Cl.[4] F28D 7/12
U.S. Cl. 159—6.1 11 Claims



1. An evaporator for eliminating water from liquids or for cooling liquids by direct expansion of a refrigerant fluid, comprising at least three substantially frusto-conical jackets including an outer jacket, an inner jacket and at least one intermediate jacket, said jackets being coaxially superimposed so as to define respective annular spaces therebetween, each of said jackets having a small end and a large end, the ends of the jackets being closed, except the small end of the inner jacket, which is open and communicates with a chamber defined inside the inner jacket; inlet and outlet means for a first fluid connected to respective ends of the annular space between the outer jacket and the adjacent intermediate jacket; inlet and outlet means for a second fluid respectively connected to the large end of the annular space between the inner jacket and the adjacent intermediate jacket and to the base of the chamber defined inside said inner jacket; and a helical element disposed at least in the annular space between said inner jacket and the adjacent intermediate jacket and defining with the adjacent conical surfaces of said annular space, a helical channel leading from the inlet to the outlet of said space, said first fluid being a heat donating or heat accepting fluid, and said second fluid undergoes a change of state while flowing in the helical channel defined between the inner jacket and adjacent intermediate jacket, means for enabling the centrifugal force acting on said second fluid to assist in separating said second fluid into liquid and gaseous phases, the liquid phase being arranged in contact with the inner wall of the intermediate jacket, and including the cross-section of the helical channel between the inner jacket and the adjacent intermediate jacket being dimensioned to increase from the respective inlet means towards the respective outlet means sufficient to accommodate the increased volume of the gaseous phase.

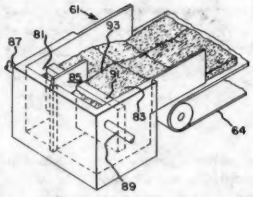
7. A refrigeration apparatus for cooling liquids by direct expansion of a refrigerant fluid, comprising three substantially frusto-conical jackets including an outer jacket, an inner jacket and one intermediate jacket, said jackets being coaxially superimposed so as to define respective annular spaces therebetween, each of said jackets having a small end and a large end, the ends of the jackets being closed, except the small end of the inner jacket, which is open and communicates with a chamber defined inside the inner jacket; inlet and outlet means for a liquid to be cooled connected to respective ends of the annular space between the outer jacket and the intermediate jacket; inlet and outlet means for a refrigerant fluid respectively connected to the large end of the annular space between the inner jacket and the intermediate jacket and to the base of the chamber defined inside said inner jacket; and a helical element disposed in each of said annular spaces and defining with the adjacent conical surfaces of the respective annular space, a helical channel leading from the inlet to the outlet of said space, said inlet means for refrigerant fluid being connected to a condenser and said chamber being connected to a compressor, means for enabling the centrifugal force acting on the refrigerant fluid to assist in separating the refrigerant fluid into liquid and gaseous phases, the liquid phase being arranged in contact with the inner wall of the intermediate jacket and including the cross-section of the helical channel between the inner jacket and the adjacent intermediate jacket being dimensioned to increase from the respective inlet means towards the respective outlet means sufficient to accommodate the increased volume of the evaporated refrigerant fluid.

4,612,087

METHOD OF PRODUCING SEAMLESS CERAMIC FIBER COMPOSITE ARTICLES

John D. Ten Eyck, Lewistown, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 348,482, Feb. 12, 1982, Pat. No. 4,435,468. This application Sep. 2, 1983, Ser. No. 529,077
Int. Cl.[4] B32B 5/22; E04B 1/00
U.S. Cl. 162—129 6 Claims



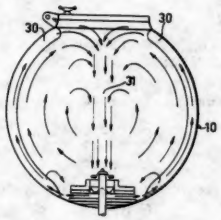
1. A method of forming a seamless composite ceramic fiber insulating mat which includes at least one portion comprising a sheet of lower temperature resistant insulating ceramic fibers and at least one portion comprising a sheet of higher temperature resistant insulating ceramic fibers wherein said at least one lower temperature resistant portion and said at least one higher temperature resistant portion are joined edge-to-edge by a transition zone of commingled fibers of said lower temperature resistant fibers and said higher temperature resistant fibers at the adjoining edges of the sheets, said method comprising providing a first liquid stream of ceramic fibrous material, providing at least one additional liquid stream of a different ceramic fibrous material having a different resistance to temperature, bringing the streams together in side-by-side relationship immediately prior to bringing said streams concurrently into contact with a foraminous member at different side-by-side portions thereof, removing liquid from the streams of fibrous material through said foraminous member and recovering a seamless composite mat.

4,612,088

REACTOR TO PERFORM CHEMICAL REACTIONS WITH A DISINTEGRATING DISC

Franco Nardi, Stockholm, Sweden, assignor to Sunds Defibrator AB, Stockholm, Sweden

PCT No. PCT/SE83/00100, § 371 Date Oct. 2, 1984, § 102(e) Date Oct. 2, 1984, PCT Pub. No. WO84/03724, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 18, 1983, Ser. No. 668,375
Int. Cl.[4] D21B *1/14*; D21C *7/10, 7/14*
U.S. Cl. 162—235 5 Claims



1. Apparatus for reacting a solution of cellulosic pulp material under intimate and turbulent contact with a chemical composition while simultaneously subjecting the pulp material to a disintegrating treatment, said apparatus comprising:

(a) a stationary pressure-sealed substantially spherical reactor vessel in which the pulp material is received and treated under conditions of elevated pressure and temperature, said reactor vessel having a top portion and a bottom portion for admitting the material to be treated and for discharging the treated material, respectively;

(b) a rotor member mounted to rotate within said reactor vessel adjacent said bottom portion, about a substantially vertical axis;

(c) a stator disc in said bottom portion spaced from and facing said rotor member to define a disintegrating area therebetween;

(d) a helico-centrifugal pump connected with said rotor member for conducting said pulp material axially into said disintegrating area by the aspirational effect generated by the rotation of said rotor and simultaneously generating an impeller action effective to eject the pulp material radially outwards from said disintegrating area and thence in a generally upward direction in turbulent flow within the confines of the walls of said spherical reactor vessel with consequent enhancement of the disintegrating action;

(e) means for injecting said chemical composition into said disintegrating area; and

(f) baffle elements extending along the walls of said reactor vessel for indirectly heating said pulp material while it is being treated in said reactor vessel.

4,612,089

SURGE SUPPRESSION DEVICE

Edward G. Hauptmann, West Vancouver, Canada, assignor to Devron Engineering Ltd., North Vancouver, Canada

Filed Mar. 16, 1984, Ser. No. 590,143
Int. Cl.[4] D21F *1/06*
U.S. Cl. 162—336 17 Claims

1. Appartus to reduce pressure pulsations in a pipe line, the apparatus comprising:

a central pipe adapted to be connected to the pipe line and having an inner surface;

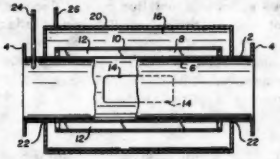
a resilient liner on the inner surface of the central pipe;

a first tubular housing located substantially concentrically around the central pipe to define an intermediate chamber between the central pipe and the first tubular housing and open at each end;

an opening in the central pipe closed by the liner whereby pressure variations in the central pipe may be communicated to the intermediate chamber;

means attaching the first tubular housing on the central pipe;

a second tubular housing, substantially concentric with the first tubular housing and defining an outer chamber, between the first and second tubular housings, extending beyond each open end of the intermediate chamber so that the outer chamber communicates with the intermediate chamber through the open ends of the first tubular housing, having end walls extending from the end of the second tubular housing; thereby defining a passageway between the first housing to the central pipe, forming the outer chamber, the end walls being spaced away from the walls of the first tubular housing, thereby defining a passageway between the first housing and the second housing and having an inlet means for introducing a gas into the outer chamber so that a selected pressure may be maintained within the intermediate and outer chamber.

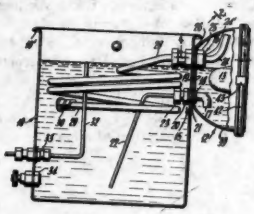


4,612,090

WATER DEGASIFICATION AND DISTILLATION APPARATUS

John C. Ellis, Jr., 1084 Palmer Ave., Larchmont, N.Y. 10538

Continuation-in-part of Ser. No. 269,880, Jun. 3, 1981, Pat. No. 4,420,374. This application Apr. 29, 1983, Ser. No. 489,767
Int. Cl.[4] B01D *3/02*; C02F *1/04*
U.S. Cl. 202—176 15 Claims



1. Water degasification and distillation apparatus comprising a container for holding water to be degasified and distilled, a condenser in said container having an inlet and outlet, a boiler of relatively small volume, a lower water inlet on said boiler and communicating with said container at a point substantially below the level of the water in said container for feeding water freely to and from said boiler, said boiler being positioned relative to said container to normally maintain a predetermined water level within said boiler, an upper outlet on said boiler above said predetermined water level and communicating with the inlet of said condenser, and means for heating water in said boiler and periodically ejecting it therefrom including a heating element in said boiler and generating heat at a temperature sufficient to produce steam at a greater rate than said steam can be discharged from said upper outlet creating a pressure in said boiler sufficient to force water in said boiler back into said container through said lower water inlet until the pressure in said boiler is relieved and boiling interrupted whereupon water will again flow into said boiler to said predetermined level, said boiler being formed of a single open-sided housing and a

readily accessible cover plate removably sealed to said open side for ready access to the boiler.

4,612,091

CHROMIUM ELECTROPLATING TRIVALENT CHROMINUM BATH THEREFORE AND METHOD OF MAKING SUCH BATH

Patrick Benaben, l'Horme, and René Tardy, Firminy, both of France, assignors to Asociation pour la Recherche et le Developpement des Methodes et Processus Industriels, Paris, France

Continuation of Ser. No. 509,061, Jun. 29, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,476

Claims priority, application France, Jun. 30, 1982, 82 11488

Int. Cl.⁴ C25D *3/06*

U.S. Cl. 204—51 **16 Claims**

1. A method of forming an electroplating bath for electroplating metallic chromium, wherein said bath is composed of an aqueous solution of halogenated trivalent chromium ions, wherein said method comprises the step of completely reducing a sufficient quantity of chromium trioxide in a hydrochloric acid medium so as to produce a bath having a pH of less than 1.5 and a concentration of Cr^{3+} ions between 5.2 and 51.99 g/l, wherein said reducing step comprises the steps of:

(i) reducing chromium trioxide with a reducing agent selected from the group consisting of: alcohol, hydrogen peroxide, hyposulfite, and sulfur dioxide; and

(ii) producing Cr^{3+} ions as a result of reducing step (i) that are always unchelated and uncomplexed with a material selected from the group consisting of: hydroxyl containing ions and organic molecules.

4,612,092

PREPARATION OF AROMATIC CARBOXYLATES

Dieter Degner, Dannstadt-Schauernheim; Eberhard Steckhan, Meckenheim, and Karl H. Grosse-Brinkhaus, Steinfurt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

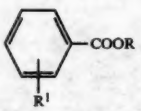
Filed Sep. 27, 1985, Ser. No. 781,354

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435388

Int. Cl.⁴ C25B *3/02*

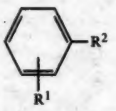
U.S. Cl. 204—59 R **4 Claims**

1. A process for the preparation of an aromatic carboxylate of the formula



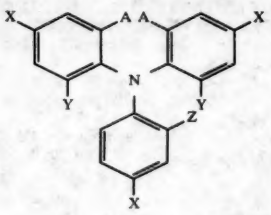
(I)

where R is alkyl of 1 to 4 carbon atoms and R^1 is hydrogen, halogen, alkyl, aryl, hetaryl, alkoxy, aryloxy, acyl, acyloxy or cyano, wherein a benzene derivative of the formula



(II)

where R^2 is methyl or a radical of the formula $—CH(OR)_2$ and R and R^1 have the above meanings, is subjected to electrolysis with an alcohol of the formula ROH in the presence of a triarylamine compound of the formula



(III)

where the two radicals A either are each hydrogen or together form a single bond, X is halogen, $H_3COC—$ or NC—, and Y and Z are each hydrogen or halogen, at a current density of from 0.25 to 5 A/dm² and at 5°–10° C. below the boiling point of the alcohol.

4,612,093

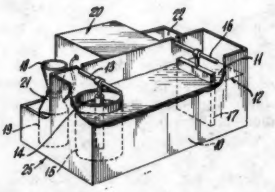
METHOD AND APPARATUS FOR PURIFICATION OF GOLD

Peter S. Shor, New York, N.Y., assignor to Shor International Corporation, New York, N.Y.

Filed May 31, 1985, Ser. No. 740,133

Int. Cl.⁴ C25C *1/06*

U.S. Cl. 204—111 **17 Claims**



1. A halide electrolyte for electrolyzing solid metallic gold anodes comprising an aqueous solution of a halide ion source, containing, initially, an impregnating agent for modifying the electropotential of the metallic gold upon initiating electrolysis, and thus forming upon electrolysis a pregnant electrolyte for continuously forming gold ions: said impregnating agent being a nascent oxygen source added as a compound in an amount of between one part per million and 0.5% by volume of said electrolyte.

4,612,094

ELECTRICAL CONDITIONING OF A PLATINUM ELECTRODE USEFUL IN MEASUREMENT IN HYPOCHLORITE

James W. Davenport, Lake Jackson, Tex., and Thomas H. Perry, Jr., Dalton, Ga., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1985, Ser. No. 762,224

Int. Cl.⁴ C25F *1/04*

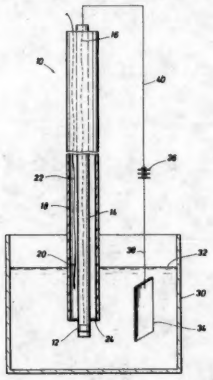
U.S. Cl. 204—141.5 **12 Claims**

1. A method of preconditioning corrosion resistant electrodes made of platinum, gold, silver, or noble metals and subject to forming a film thereon resulting from use; the method comprising the preuse, pretreatment steps of:

(a) immersing the electrode in an acid bath before use;

(b) additionally placing a sacrificial oxide coated titanium electrode in the bath;

(c) connecting a DC power source to the electrode and also the titanium electrode wherein the power source is connected such that the negative terminal thereof connects to the metal electrode and the titanium electrode is connected to the positive terminal thereof; and



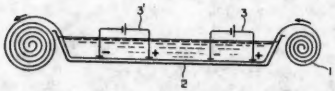
(d) adjusting the voltage of the power source to a value causing current to flow through the acid solution for an interval sufficient to clean film from the electrode.

4,612,095

METHOD FOR IMPROVING CORROSION RESISTANCE OF BRIGHT ANNEALED STAINLESS STEEL

Hiroyasu Omata; Satoshi Ito, and Tomomi Murata, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,490
Claims priority, application Japan, Apr. 14, 1984, 59-73910
Int. Cl.[4] C25F *1/00*
U.S. Cl. 204—144.5 12 Claims



1. A method for improving corrosion resistance of bright annealed stainless steel, which comprises subjecting said stainless steel to alternating electrolysis in an aqueous nitric acid solution having a nitric acid concentration 1 to 7 weight % in such a manner that said stainless steel acts as an anode at least twice with the anode in the final run of electrolysis.

4,612,096

METHOD FOR MAKING AMMONIA BY THE REDUCTION OF MOLECULAR NITROGEN

Norman N. Lichtin, Newton, and Kallambella M. Vijayakumar, Boston, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Jul. 25, 1984, Ser. No. 634,332
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—157.46 13 Claims

1. A method for making ammonia by the reduction of molecular nitrogen comprising the steps of:

combining a metal oxide catalyst with molecular nitrogen and an aqueous preparation of an organic compound as a reaction mixture at a temperature not more than 60° C.; and adding photoenergy to said reaction mixture.

4,612,097

PROCESS FOR SEPARATION OF ZIRCONIUM ISOTOPES

John F. Jackovitz, Monroeville Boro, and Steven H. Peterson, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 550,850, Nov. 14, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,417
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—157.2 17 Claims

1. A process for reducing the zirconium 91 isotopic content of zirconium comprising:

(A) forming a solution which comprises:

(1) a solvent;

(2) a scavenger selected from the group consisting of 8-hydroxyquinoline, derivatives of 8-hydroxyquinoline, and mixtures thereof;

(3) a compound containing zirconium which is soluble in said solution and which reacts with said scavenger when exposed to light having a wavelength of about 220 to about 600 nm;

(B) irradiating said solution with light having a wavelength of about 220 to about 600 nm for a time selected to photoreact a disproportionate amount of said compound containing said zirconium 91 isotope with said scavenger; and

(C) separating the product of said reaction from said solution.

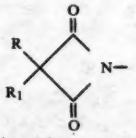
4,612,098

PROCESS FOR ELECTRODEPOSITION USING AZETIDINEDIONE COMPOUNDS AS CROSSLINKERS

Shenghong A. Dai, Wallingford, and Philip W. Sherwood, Milford, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 660,768, Oct. 15, 1984, Pat. No. 4,576,980. This application Dec. 20, 1985, Ser. No. 811,852
Int. Cl.[4] C25D *13/06, 13/10*
U.S. Cl. 204—181.7 9 Claims

1. In a process for preparing a substrate coated with a heat cured film said process comprising first electrodepositing a composition comprising an aqueous dispersion of a polymer having amine groups selected from the group consisting of primary amines, secondary amines, and mixtures thereof said amines being in the form of their acid salts and a crosslining agent upon a cathode substrate disposed within an electrocoating bath to form a heat-curable film thereon and thereafter heating said substrate and heat-curable film to cure said film, the improvement which comprises employing as said crosslinking agent a compound having at least two azetidinedione groups of the formula

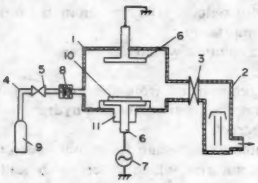


wherein R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, said azetidinedione crosslinking agent being present in at least an equivalent amount to react with substantially all of said amine groups.

4,612,099
REACTIVE ION ETCHING METHOD

Masuo Tanno, Osaka, and Yuichiro Yamada, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1984, Ser. No. 629,596
Claims priority, application Japan, Jul. 12, 1983, 58-126518
Int. Cl.[4] H01L *21/306*; C23C *15/00*
U.S. Cl. 204—92.32 7 Claims



1. In a reactive ion etching method using a halogenized gas as a main composition of an etching gas with the use of a reactive ion etching apparatus including a vacuum vessel, exhaust means connected to said vacuum vessel, etching gas supply means, plasma generating electrodes disposed inside or outside of said vacuum vessel, and a high frequency power supply for supplying a high frequency electric power to said electrodes,

said reactive ion etching method characterized in that a substance having a catalytic action is inserted in said etching gas supply means in the path thereof, and in that a catalyst for dehydrogenation is used as said substance having a catalytic action, when a halogenized gas containing hydrogen atoms is used as said main composition of the etching gas.

4,612,100
METHOD FOR THE FABRICATION OF AN IMPLANTABLE ELECTRODE

Martin Edeling, Erlangen; Helmüt Freller, Röthenbach; Konrad Münd, Uttenreuth, and Peter Schack, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

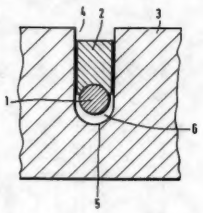
Filed Dec. 13, 1984, Ser. No. 681,181
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345990
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.15 10 Claims

1. In a method for manufacturing an electrode implantable in the tissues of a living organism, said electrode having a body portion with an outer surface, the improvement comprising the step of sputtering a layer of vitreous carbon from a target of vitreous carbon on at least a portion of the outer surface of the electrode body portion, said layer having a microporous structure and said step of sputtering being performed at a pressure 4 to 8×10^{-2} mbar and at a voltage of 1.6 to 2.4 kV with a power input 0.5 to 1.5 kW.

4,612,101
APPARATUS FOR THE ELECTROCHEMICAL ETCHING OF GROOVES OF VERY SMALL WIDTH

Bernd Wolter, Remscheid, and Paul G. Pott, Wermelskirchen, both of Fed. Rep. of Germany, assignors to AEG Elotherm GmbH, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,315
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419503
Int. Cl.[4] B23H *9/14*, *3/04*, *3/10*
U.S. Cl. 204—224 M 6 Claims



1. An apparatus for the electrochemical etching of a groove of very small width in a workpiece, comprising:

an electrode extending across the workpiece in a direction selected for the etching of the groove and being capable of sinking into the workpiece to form a work gap therein; and

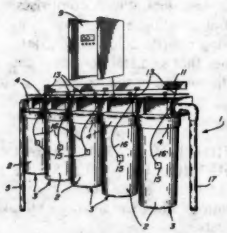
a baffle means, arranged on top of the electrode, for extending over an entire working length of the electrode, said baffle means having a width corresponding to the very small width of the groove;

whereby the work gap in the groove being etched electrochemically in the workpiece remains filled with an electrolyte liquid along the entire working length of the electrode and a flowing away of the electrolyte liquid takes place essentially in a longitudinal direction of the work gap.

4,612,102
SILVER RECOVERY SYSTEM

René J. Brimo, Kirkland; John Larivière, Laval, and James Riedl, Pierrefonds, all of Canada, assignors to Siltec Marketing International Ltd., Dorval, Canada

Filed Jul. 24, 1985, Ser. No. 758,504
Int. Cl.[4] C25C *7/06*; C25D *21/18*
U.S. Cl. 204—228 11 Claims



1. A power supply for a silver recovery system, which system includes at least one cell, for holding an electrolyte containing the silver to be recovered, an anode, a cathode onto which the silver is plated, and a pump for pumping electrolyte to the cell;

said power supply comprising:

means for providing power to said cell, said means for pro-

viding power having an input terminal, a first output terminal, connected to the anode of said cell, a control terminal whereby to set said means for providing power to a standby level or a plating level, and a second output terminal;

means for sensing the current drawn from said means for providing power, said means for sensing having an input terminal, connected to said second output terminal of said means for providing power, and an output terminal;

current generator means for generating a current of a predetermined amplitude, said current generator means having an output terminal; and

comparator means for comparing the amplitude of the sensed current with said predetermined amplitude having a first input terminal, a second input terminal and a first output terminal;

the output terminal of said means for sensing current being connected to the first input terminal of said comparator means;

the output terminal of said current generator means being connected to the second input terminal of said comparator means;

the output terminal of said comparator means being connected to the control terminal of said means for providing power;

whereby, when sensed current exceeds said predetermined amplitude, said means for providing power is set to said plating level, and when said sensed current is less than said predetermined amplitude, said means for providing power is set to said standby level.

4,612,103

ALUMINIUM REDUCTION CELLS

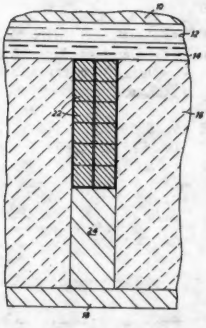
Ernest W. Dewing; Adam J. Gesing, both of Kingston; Thomas J. Hudson, Beaconsfield, all of Canada; Louis J. Manfredo, Painted Post, N.Y.; Douglas J. Wheeler, Cleveland Heights, Ohio; William R. Bennett, North Olmstead, Ohio, and Thomas M. Clere, Willowick, Ohio, assignors to Alcan International Limited, Montreal, Canada

Filed Nov. 28, 1984, Ser. No. 675,732

Claims priority, application United Kingdom, Nov. 29, 1983, 8331769; Jul. 9, 1984, 8417542

Int. Cl.⁴ C25C *3/08, 3/16*

U.S. Cl. 204—243 R **13 Claims**



1. An aluminium reduction cell including a potlining and embedded therein at least one cathode current collector including a section comprising a major proportion by volume of discrete electrically-conducting aluminium-wettable bodies joined or surrounded by aluminium-containing metal, the section being so positioned that the metal is at least partly fluid when the cell is in operation.

4,612,104

ELECTROCHEMICAL CELL

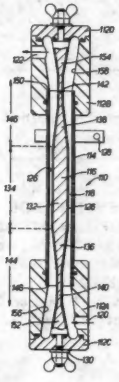
John P. Holmes, Newcastle upon Tyne, and Roderick W. Froud, Chester-le-Street, both of United Kingdom, assignors to Cogent Ltd., London, England

Filed Sep. 20, 1984, Ser. No. 652,079

Claims priority, application United Kingdom, Sep. 29, 1983, 8326170

Int. Cl.⁴ C25B *9/00, 15/08*

U.S. Cl. 204—272 **6 Claims**



1. An electrochemical cell having wall means defining an annular flow passage for electrolyte solution and an inlet to and an outlet from said annular passage at opposite ends of said cell, said wall means being adapted to induce non-turbulent flow through said annular passage and comprising a tubular outer electrode and an inner electrode supported within said outer electrode, said annular passage being substantially free of turbulent-flow-inducing features, said electrodes together defining an intermediate zone in which said annular passage is of constant cross section and end zones in which said annular passage progressively increases in cross section to a maximum value thereof in a direction away from said intermediate zone and towards said inlet and said outlet, respectively, whereby the transverse separation of said electrodes in said end zones exceeds the transverse separation of said electrodes in said intermediate zone.

4,612,105

CARBONACEOUS ANODE WITH PARTIALLY CONSTRICTED ROUND BARS INTENDED FOR CELLS FOR THE PRODUCTION OF ALUMINIUM BY ELECTROLYSIS

Bernard Langon, Saint-Jean-de-Maurienne, France, assignor to Aluminium Pechiney, Paris, France

Filed May 28, 1985, Ser. No. 738,395

Claims priority, application France, May 29, 1984, 84 08816

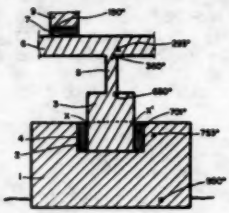
Int. Cl.⁴ C25B *11/00;* **C25C** *3/06*

U.S. Cl. 204—286 **9 Claims**

1. In a carbonaceous anode for a cell for the production of aluminum by igneous electrolysis according to the Hall-Heroult process, said anode including at least one steel conductor having a lower portion penetrating into said anode, with said steel in conductive contact with said carbonaceous anode, and an upper portion adapted to be connected to a positive terminal of a source of current for the cell,

the improvement wherein said upper portion comprises a longitudinal portion of reduced cross sectional area, the

length of said longitudinal portion being at least 30% of the length of said upper portion and the cross sectional



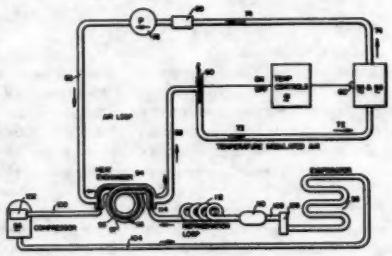
area of said longitudinal portion being at most equal to 60% of the cross sectional area of said lower portion.

4,612,106

COOLING SYSTEM FOR A SLAB GEL ELECTROPHORESIS APPARATUS

Heiner M. Kromer, 115 E. 87th St., Apt. 35C, New York, N.Y. 10028, and Daniel November, 82-11 Greenfell St., Ken Gardens, Queens, N.Y. 11415

Filed Dec. 24, 1984, Ser. No. 685,798
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R **8 Claims**



1. A gel slab electrophoresis apparatus, comprising:

(a) a sample unit including a pair of transversely-spaced first and second plates containing a gel, said first and second plates having open top and bottom slots therebetween;

(b) an upper solution chamber filled with a first conductive solution, said first solution in fluid communication with said gel through said top slot;

(c) a lower solution chamber filled with a second conductive solution, said second solution in fluid communication with said gel through said bottom slot;

(d) means for applying an electrical potential between said upper and lower solution chambers and, thereby, across the vertical length of said contained gel; and

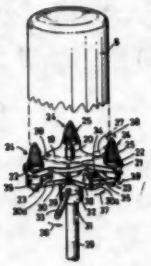
(e) a heat sink in substantial thermal communication with said sample unit, said heat sink comprising means for continuously controlling the temperature of said sample unit, the controlling means comprising a closed-loop pneumatic circuit disposed in thermal communication with said sample unit, the temperature controlling means including means for continuous inflow and outflow of air through said pneumatic circuit, said closed-loop pneumatic circuit including air refrigeration means and heating means for respectively cooling and heating the region of thermal communication between said pneumatic circuit and said sample unit, responsive to temperature monitoring means disposed upon one of said plates of said sample unit, said controlling means further comprising thermostat means for regulation of the "on" period of said heating means relative to the operation of said cooling means.

4,612,107

DEVICE FOR HOLDING HOLLOW BODIES

Hans-Jürgen Schlinsog, Cremlingen, and Siegfried Kowalzik, Wuppertal, both of Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 692,026
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402911
Int. Cl.[4] C25D *13/14*
U.S. Cl. 204—300 EC **10 Claims**



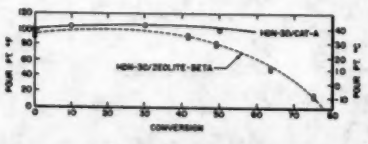
1. A device for selectively holding and releasing hollow bodies of electrically conductive material, such as cans of metal, while they are conveyed through an electrophoretic dip path provided with a conveying element which runs through the dip bath and seizes, in continual succession, the open ends of the individual hollow bodies by their outwardly flanged edge and temporarily holds them, wherein conical holders for the individual hollow bodies are arranged on the conveying element, which conical holders are movable and have gripping devices for gripping, in a detachable manner, the flanged edge of the hollow body.

4,612,108

HYDROCRACKING PROCESS USING ZEOLITE BETA

Philip J. Angevine, West Deptford; Kenneth M. Mitchell, Mt. Laurel; Stephen M. Oleck, Morristown, and Stuart S. Shih, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,187
Int. Cl.[4] C10G *47/16*
U.S. Cl. 208—111 **20 Claims**

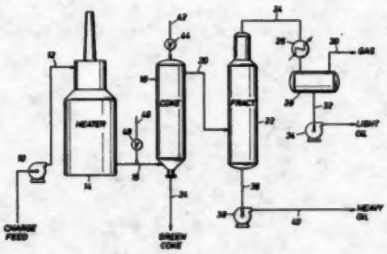


1. A process for the hydrocracking and dewaxing of a petroleum fraction comprising waxy components boiling above 345° C., which comprises passing the fraction over a hydrocracking catalyst comprising zeolite beta and a matrix material in the presence of hydrogen and under hydrocracking conditions, the proportion of zeolite beta in the hydrocracking catalyst increasing in the direction in which the fraction is passed.

4,612,109
METHOD FOR CONTROLLING FOAMING IN DELAYED COKING PROCESSES

Edward T. Dillon, Houston, Tex., and David L. Edmonds, Wichita, Kans., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 201,573, Oct. 28, 1980, abandoned. This application May 16, 1985, Ser. No. 734,958
Int. Cl.[4] C10G 9/14
U.S. Cl. 208—131 15 Claims



1. In a delayed coking process wherein a heated feed stock is fed to a coking drum, the improvement comprising adding to said feed stock a foam controlling amount of an anti-foaming composition comprising a C_6–C_{12} aliphatic alcohol.

4,612,110
HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Thomas Davis; Howard F. Efner; Robert J. Hogan, and Daniel M. Coombs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 540,597, Oct. 11, 1983, abandoned. This application Mar. 14, 1984, Ser. No. 589,362
Int. Cl.[4] C10G 45/08, 47/12, 49/04
U.S. Cl. 208—251 H 23 Claims

1. A process for hydrofining a hydrocrabon-containing feed stream comprising the steps of:

introducing a decomposable molybdenum dithiocarbamate compound into said hydrocarbon-containing feed stream, wherein a sufficient quantity of said decomposable molybdenum dithiocarbamate compound is added to said hydrocarbon-containing feed stream to result in a concentration of molybdenum in said hydrocarbon-containing feed stream in the range of about 1 to about 30 ppm; and

contacting said hydrocarbon-containing feed stream containing said decomposable molybdenum dithiocarbamate compound under suitable hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table, wherein the concentration of said promoter is greater than about 1 weight percent, based on the weight of said catalyst composition, when said catalyst composition is initially contacted with said hydrocarbon-containing feed stream.

4,612,111
CONTROL OF A CRUDE OIL PREHEAT FURNACE

James A. Hofferber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1984, Ser. No. 589,364
Int. Cl.[4] B01D 3/42; C10G 7/12
U.S. Cl. 208—350 6 Claims

1. Apparatus comprising:

a furnace having first, second, third and fourth coils;

a crude tower;

means for passing a crude oil feed through said first, second, third and fourth coils, wherein the crude oil feed flowing through said first and second coils is combined into a first crude oil stream after passing through said furnace, wherein the crude oil flowing through said third and fourth coils is combined into a second crude oil stream after passing through said furnace and wherein said first crude oil stream and said second crude oil stream are combined into a third crude oil stream which is provided as a feed to said crude tower;

means for supplying a first fuel stream to said furnace, wherein the combustion of said first fuel stream supplies heat to said first and second coils;

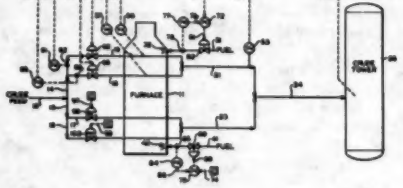
means for supplying a second fuel stream to said furnace, wherein the combustion of said second fuel stream supplies heat to said third and fourth coils;

means for establishing a first signal representative of the actual overflash flow rate in said crude tower;

means for establishing a second signal representative of the desired overflash flow rate in said crude tower;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the temperature of said third crude oil stream required to maintain the actual overflash flow rate in said crude tower substantially equal to the desired overflash flow rate represented by said second signal;

means for manipulating the flow rate of said first fuel stream



to said furnace and the flow rate of said second fuel stream to said furnace in response to said third signal to thereby maintain the actual temperature of said third crude oil stream substantially equal to the desired temperature of said third crude oil stream represented by said third signal;

a first control valve operably located so as to control the flow of crude oil through said first coil;

a second control valve operably located so as to control the flow of crude oil through said second coil;

a third control valve operably located so as to control the flow of crude oil through said third coil;

a fourth control valve operably located so as to control the flow of crude oil through said fourth coil;

means for establishing a fourth signal representative of the temperature of the crude oil flowing through said first coil;

means for establishing a fifth signal representative of the temperature of the crude oil flowing through said second coil;

means for establishing a sixth signal representative of the average of said fourth signal and said fifth signal;

means for comparing said fourth signal and said sixth signal and for establishing a seventh signal which is responsive to the difference between said fourth signal and sixth signal, wherein said seventh signal is scaled so as to be representative of the position of said first control valve required to maintain the actual temperature of the crude oil flowing

through said first coil substantially equal to the average temperature represented by said sixth signal;

means for manipulating said first control valve in response to said fourth signal;

means for comparing said fifth signal and said sixth signal and for establishing an eighth signal which is responsive to the difference between said fifth signal and said sixth signal, wherein said eighth signal is scaled so as to be representative of the position of said second control valve required to maintain the actual temperature of the crude oil flowing through said second coil substantially equal to the average temperature represented by said sixth signal;

means for manipulating said second control valve in response to said eighth signal;

means for establishing a ninth signal representative of the temperature of the crude oil flowing through said third coil;

means for establishing a tenth signal representative of the temperature of the crude oil flowing through said fourth coil;

means for establishing an eleventh signal representative of the average of said ninth signal and said tenth signal;

means for comparing said ninth signal and said eleventh signal and for establishing a twelfth signal which is responsive to the difference between said ninth signal and eleventh signal, wherein said twelfth signal is scaled so as to be representative of the position of said third control valve required to maintain the actual temperature of the crude oil flowing through said third coil substantially equal to the average temperature represented by said eleventh signal;

means for manipulating said third control valve in response to said twelfth signal;

means for comparing said tenth signal and said eleventh signal and for establishing a thirteenth signal which is responsive to the difference between said tenth signal and said eleventh signal, wherein said thirteenth signal is scaled so as to be representative of the position of said fourth control valve required to maintain the actual temperature of the crude oil flowing through said fourth coil substantially equal to the average temperature represented by said eleventh signal; and

means for manipulating said fourth control valve in response to said thirteenth signal.

4,612,112

AMIDOCARBOXYLIC ACIDS AS FLOTATION AGENTS

Piotr Swiatkowski, Huddinge, Sweden, assignor to Kenobel AB, Nacka, Sweden

Filed Mar. 1, 1985, Ser. No. 707,221

Claims priority, application Sweden, Mar. 7, 1984, 8401241

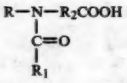
Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **19 Claims**

1. A process for the separation of apatite, scheelite and fluorspar minerals from raw materials which contain said minerals in association with silica, silicates or iron mineral gangues, which process comprises the steps of:

(1) forming a pulp of said raw mineral,

(2) treating said raw material pulp with a collector reagent comprising an amidocarboxylic acid having the general formula



wherein R is an aliphatic group having 8 to 18 carbon atoms, R_1 is hydrogen or a lower aliphatic group having 1 to 4 carbon atoms or such an aliphatic group substituted with a carboxylic group, and R_2 is a straight or branched alkylene group with 1 to 4 carbon atoms, or a salt thereof, in an amount effective to form a froth,

(3) carrying out froth flotation at a pH above 6 and collecting said minerals as a froth product while removing said gangues as tailings.

4,612,113

REPEATING FLOTATION MACHINE

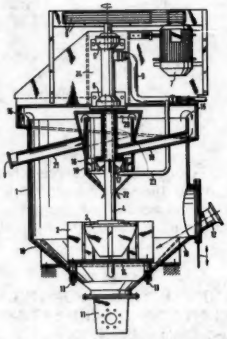
Jouko O. Kallioinen, Outokumpu, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Dec. 20, 1984, Ser. No. 684,747

Claims priority, application Finland, Dec. 29, 1983, 834846

Int. Cl.[4] B03D *1/16, 1/24*

U.S. Cl. 209—170 **12 Claims**



1. A repeating flotation machine for separating minerals and the like from sludge by flotation, comprising a primary flotation cell and a repeat flotation cell, each flotation cell containing a mixer comprising a rotor and a stator, and each having a waste material output and a concentrate output, the repeat cell also having a feed material input connected to the concentrate output of the primary cell and the primary cell also having a feed material input connected to the waste material output of the repeat cell, the repeat cell being located within the primary cell.

4,612,114

METHOD AND APPARATUS FOR SEPARATING DIFFERENT CONSTITUENTS

Carl Kiesow, Norderstedt, Fed. Rep. of Germany, assignor to Carl Kiesow Rohstoffrückewinnung, Fed. Rep. of Germany

Continuation of Ser. No. 574,294, Jan. 26, 1984, abandoned. This application Jul. 16, 1985, Ser. No. 755,549

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302490

Int. Cl.[4] B03D *5/28*

U.S. Cl. 209—172 **2 Claims**

1. A separating apparatus for separating a heavy and a light solid fraction from a dispersion in a dense liquid medium comprising:

a receptacle for said dense liquid medium,

a partition wall subdividing said receptacle into a settling chamber and a lift-off chamber,

said partition wall being formed with a gap at the bottom of said receptacle to provide fluid communication between the aforementioned chambers,

said settling chamber having an inlet for the dispersion and having an inclined floor extending downwardly toward said lift-off chamber,

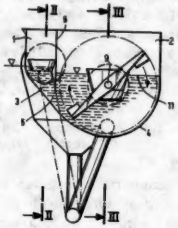
a rotary lift-off arm mounted for rotation in said lift-off

chamber and having scoops at its ends for lifting sunken particles from said heavy fraction from the floor of said lift-off chamber and out of said apparatus,

the axis of rotation of said lift-off arm being parallel with respect to said partition wall, the direction of rotation being such that said scoops move upwardly when approaching said gap from the bottom of said lift-off chamber,

said lift-off chamber having an outlet for the heavy fraction and having a floor forming an extension of and merging with said inclined floor of said settling chamber and being at least partially arcuate to accommodate the path of travel of said scoops,

a first intake for said dense liquid medium in said lift-off chamber disposed in the area of the floor of said lift-off chamber,



a second intake for said dense liquid medium in said settling chamber disposed slightly below the level of said dense liquid medium,

overflow means in said settling chamber arranged to discharge light fraction material out of said settling chamber and out of said apparatus, said overflow means being disposed opposite to said second intake,

said first intake and said second intake being disposed so as to deliver said dense liquid medium in opposite directions and parallel to said partition wall,

said first intake being arranged to produce a laminar flow of dense liquid medium in said settling chamber, and said second intake being arranged to produce a turbulent flow in said lift-off chamber.

4,612,115

FLOATING BED REACTOR

Juha Titoff, Kerimäki, Finland, assignor to Enso-Gutzeit Oy, Finland

Filed Nov. 16, 1984, Ser. No. 672,290
Claims priority, application Finland, Nov. 18, 1983, 834233
Int. Cl.[4] B01D *41/02*; C02F *3/06*
U.S. Cl. 210—189 **6 Claims**

1. A floating bed reactor, intended for biological purification of liquid suspensions containing fibrous solid matter and for its simultaneous clarification, comprising a vertical reactor tank having a liquid inlet at the lower end thereof and a liquid outlet for discharging pure and clarified liquid from said reactor tank at the upper end thereof, means in said tank for guiding the liquid to be treated as a flow ascending upwardly from the inlet through the reactor tank, a particle mass for effecting biological purification is located only within the lower part of said tank above said liquid inlet and floating in the ascending flow with said particle mass extending for a portion of the vertical height of said reactor tank and with the upper end of said particle mass being spaced downwardly from the upper end of said reactor tank so that a flow of the liquid suspension passes upwardly after traversing the particle mass, and at least one upwardly extending collecting vessel with an open top is positioned within said tank and is spaced above said floating particle mass and below said liquid outlet, said collecting vessel having a drain pipe connected to the lower end thereof with said drain pipe extending outwardly from said collecting vessel through said reactor tank whereby the ascending liquid flow passes said collecting vesssel and said collecting vessel is arranged to collect fibre agglomerate accumulating above the floating bed entering through said open top thereof, said collecting vessel is spaced inwardly from said reactor tank forming an annular passage for the unimpeded upward flow of the liquid, the collecting vessel, as it operates, being arranged to

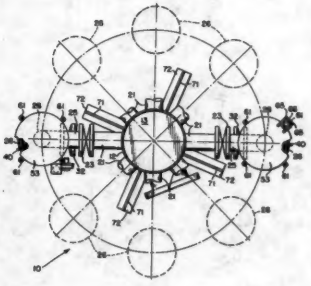
keep the top margin of the agglomerate layer in the reactor tank substantially on the level with the open top of the collecting vessel, and the open top of said collecting vessel being bordered by a flow guiding member protruding laterally outwardly therefrom and producing a trailing vortex in the ascending flow, which boosts the guiding of fibre agglomerate over the collecting vessel's open top into the vessel.

4,612,116

BACKWASHABLE FILTERING APPARATUS AND NOVEL FILTER ELEMENT THEREFOR

David B Hindman, and Joseph D. Lima, both of Rochester, N.Y., assignors to French Systems, Inc., Rochester, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,682
Int. Cl.[4] B01D *41/04*
U.S. Cl. 210—333.1 **15 Claims**



1. In backwashable filtering apparatus of the type having a plurality of filter elements for filtering fluid under pressure, means for improving the uniformity of fluid flow through said filter elements, and for permitting selective removal and replacement thereof without shutting down the apparatus, said means comprising

a hollow hub section having therein intermediate its ends a first transverse partition operatively dividing at least a portion of the interior of said hub section into a first cham-

ber for receiving under pressure fluid that is to be filtered, and a second chamber for receiving filtered fluid,

a plurality of filter housings positioned in angularly spaced relation around the outside of said hub section and each containing a removable filter element having therein a bore closed at one end, open at its opposite end, and surrounded by a porous wall,

first and second valve means connecting each of said housings to said first and second chambers, respectively, in said hub section, and disposed normally to cause fluid to flow from said first chamber radially in a first direction through the porous walls of said filter elements and then to said second chamber,

third valve means for selectively connecting said housings to a waste line, when the filter elements in said housings become dirty,

means interconnecting said first and third valve means and operable, when one of said filter elements becomes dirty, simultaneously to disconnect the housing associated with said one filter element from said first chamber and to connect the last-named housing with said waste line, whereby a portion of previously filtered fluid is caused to flow from said second chamber in a reverse direction through the porous wall of said one element to said waste line, thereby to effect the backwashing of said one element,

each of said filter elements being configured to provide substantially uniform pressure gradients thereacross, and fluid flow therethrough, during a filtering operation, and

said first and second valve means being operable selectively to disconnect said housings one at a time from both said first and second chambers.

4,612,117

LIQUID FILTER

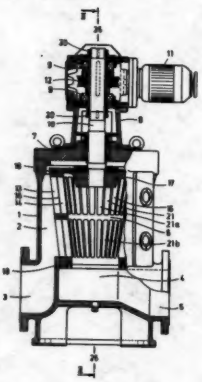
Walter Neumann, Haigerer Strasse 8, D-5900 Siegen, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,118

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430523

Int. Cl.[4] B01D *35/16*

U.S. Cl. 210—393 **7 Claims**



1. In a filter for liquids, comprising means designed for precluding the need for plural individual filter elements, including a filter drum vertically arranged in the feed chamber of a cylindrical filter housing, this filter drum exhibiting a closed upper end and an open lower end, as well as a jacket provided with passage openings and a filter medium, being rotationally driven by a shaft supported in a post on the filter housing and by a motor, and being seated with its lower, open end with running clearance in a partition between the feed and discharge chambers of the filter housing, with an inlet into the feed chamber and an outlet out of the discharge chamber, as well as with at least one backwash duct adjoining the jacket surface of the drum and being open toward the latter, said at least one duct having an outlet for the backwashing liquid; the improvement comprising a multipartite, exchangeable filter drum **(96)** with an outer **(13)** and an inner **(14)** supporting basket, these baskets defining together a screen **(15)** with passage openings for the liquid to be filtered, and a filtering basket **(16)** disposed between the two supporting baskets **(13, 14)** and made of a filtering material and overlying a plurality of said passage openings of said screen.

4,612,118

COMPOSITE SEMIPERMEABLE MEMBRANE OF POLYAMINE AND TRIANZINE

Yoshiyasu Kamiyama, and Keisuke Nakagome, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

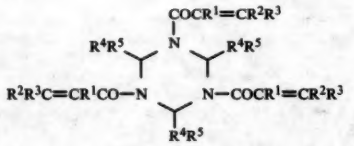
Continuation of Ser. No. 362,336, Mar. 26, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 616,750

Claims priority, application Japan, Mar. 31, 1981, 56-48963

Int. Cl.[4] B01D *13/04*

U.S. Cl. 210—490 **9 Claims**

1. A composite semipermeable membrane which comprises a porous substrate and an ultrathin dense layer having solute removal structure positioned on said substrate, said ultrathin dense layer consisting essentially of (1) an oligomer composed of polyamine monomer and triazine represented by the general formula:



wherein R^1, R^2, R^3, R^4 and R^5 each represent a hydrogen atom or an alkyl group having 1 to 5 carbon atoms crosslinked with (2) polyamine monomer, as a main component, and with a polyfunctional crosslinking reagent having two or more functional groups capable of reacting with amino groups in oligomer molecules.

4,612,119

HOLLOW FIBER FILTER MEDIUM AND PROCESS FOR PREPARING THE SAME

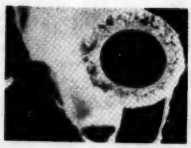
Tamiyuki Eguchi, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1984, Ser. No. 597,890

Claims priority, application Japan, Apr. 9, 1983, 58-62835

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.23 **5 Claims**



1. A filter medium in the form of a hollow fiber made of a polysulfone having a network structure over the entire thickness from the inner surface to the outer surface, and therefore, having no skin layer, the pores having a maximum diameter as

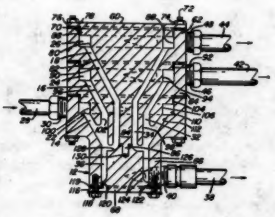
determined by measuring the largest minor axis of a pore opening observed by microscopic inspection of a portion of the filter medium, of 0.1 to 5 μm., the openings of the pores formed in the inner surface having a maximum diameter of 0.01 to 10 μm. and the openings of the pores formed in the outer surface having a maximum diameter of 0.01 to 5 μm.

4,612,120

AXISYMMETRICAL SEPARATOR FOR SEPARATING SOLIDS AND GAS FROM A FLUID MEDIUM

William A. Box, Bethel Park, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1984, Ser. No. 667,517
Int. Cl.[4] B01D *45/16*
U.S. Cl. 210—512.1 **5 Claims**



1. Apparatus for separating solids and gaseous contaminants from a flowing fluid comprising:

an axisymmetric body;

at least three annular plenums located at axially spaced positions within said body, one of said plenums being a process fluid inlet plenum and the others being fluid discharge plenums;

process fluid inlet supply means communicating with said process fluid inlet plenum, said means including means for inducing a free vortex flow in the process fluid admitted thereto;

an annular process fluid inlet passage extending through said body, said process fluid inlet passage communicating at one end with said process fluid inlet plenum and terminating at its other end in an annular discharge plenum, said passage between said inlet and discharge plenums being formed by a pair of concentrically spaced, conically formed walls extending generally axially of said body and radially inwardly in the fluid flow sense toward the axis thereof; and

each of said fluid discharge plenums communicating with one end of an annular fluid conducting passage, the other end of each of which fluid conducting passages communicating with said process fluid inlet passage at radially spaced positions therealong.

4,612,121

SEPARATION MATERIAL, METHODS OF PRODUCING A SEPARATION MATERIAL AND USE OF OROSOMUCOID, FUNCTIONAL ANALOGS THERETO OR DERIVATIVES OR FRAGMENTS THEREOF FOR SEPARATION PURPOSES

Jörgen L. E. Hermansson, Huddinge, Sweden, assignor to ChromTech AB, Huddinge, Sweden

Filed May 23, 1984, Ser. No. 613,177
Claims priority, application Sweden, Jun. 8, 1983, 8303221; Dec. 19, 1983, 8307023
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **4 Claims**

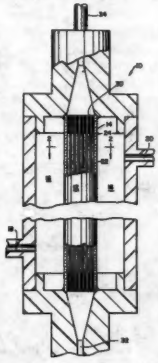
1. Method comprising chromatographically separating different substances by contacting said substance with α_1-glycoprotein immobilized by covalent coupling on microparticles.

4,612,122

REMOVING HEAVY METAL IONS FROM BLOOD

Clara Ambrus, and Csaba Horvath, both of 225 Franklin St., Boston, Mass. 02110

Continuation-in-part of Ser. No. 473,814, Mar. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 278,631, Jun. 29, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 650,772
Int. Cl.[4] B01E *13/00*
U.S. Cl. 210—638 **7 Claims**



1. A process for removing heavy metal ions from blood fluid comprising the steps of passing such fluids along the retentive barrier side of an anisotropic membrane and, while preventing any substantial liquid flow through the membrane, allowing said ions to diffuse through said membrane into contact with a mass of ion-capturing means which is in a closed container and at least partially immobilized within the porous substrate at the opposite side of said membrane from said blood, said mass being an organic chelating agent powder; wherein said membrane has a maximum nominal molecular weight retention value of about 50,000 and wherein said closed container, on being initially filled with liquid, forms means to prevent liquid

flow through said membrane and to assure only diffusion of said metal cations through said membrane.

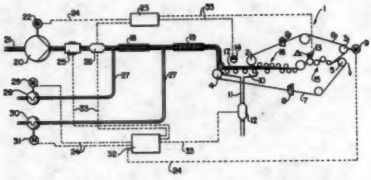
4,612,123
REGULATING APPARATUS FOR DEWATERING MACHINES

Peter Eustacchio; Heinz Perchthaler, and Rupert Syrowatka, all of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Continuation of Ser. No. 461,109, Jan. 25, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 692,997

Int. Cl.⁴ B01D *33/02*

U.S. Cl. 210—709 **13 Claims**



1. In a process for regulating a dewatering machine, in particular a double strainer sieve belt press having a strainer zone, a wedging section, a press section, means for introducing at least one flocculant in advance of said strainer zone, and a flocculant control circuit for adaption to sludges or solids-containing suspensions with varying dewatering properties, the improvement comprising the step of using the amount of sludge supplied to the strainer zone, its consistency and the amount of freely draining filtrate in said strainer zone as a control input for said flocculant control circuit.

4,612,124
METHOD OF SEWAGE TREATMENT

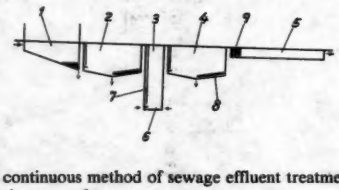
Ignacio L. Escrig, Mayor, 2, Villar del Arzobispo, Valencia, Spain

Filed Dec. 28, 1984, Ser. No. 687,156

Claims priority, application Spain, Dec. 30, 1983, 528.559

Int. Cl.⁴ C02F *1/76*

U.S. Cl. 210—721 **10 Claims**



1. A continuous method of sewage effluent treatment comprising the steps of:

(a) introducing sewage effluent having a density lower than that of a hydrogen peroxide solution into an enclosure having said hydrogen peroxide solution at its bottom in a manner to float a layer of effluent on top of the hydrogen peroxide essentially preventing mixing between the sewage effluent and the hydrogen peroxide; and

(b) chemically oxidizing the sewage effluent in said enclosure by means of rising oxygen gas, said oxygen gas being formed by reacting the hydrogen peroxide with a catalyst selected from the group consisting of potassium iodide and potassium iodide with potassium hydroxide, while said hydrogen peroxide is in communication with, but essentially unmixed with, the sewage effluent.

7. The continuous method of sewage effluent treatment wherein the sewage effluent contains suspended solids, sand, non-emulsified oils and greases, organic flocculent, insoluble organic substances, biological substances, volatile oxidized products and turbidity comprising:

(a) separating at least some suspended solids, sand, non-emulsified oils and greases from said effluent;

(b) separating at least some suspended solids from the effluent by sedimentation;

(c) introducing sewage effluent having a density lower than that of a hydrogen peroxide solution into an enclosure having said hydrogen peroxide solution at its bottom in a manner to float a layer of effluent on top of the hydrogen peroxide essentially preventing mixing between the sewage effluent and the hydrogen peroxide; (d) chemically oxidizing the effluent, by means of rising oxygen gas, said oxygen gas being formed below said sewage effluent by reacting hydrogen peroxide with a catalyst selected from the group consisting of potassium iodide and potassium iodide with potassium hydroxide while said hydrogen peroxide is in communication with, but essentially unmixed with the effluent;

(e) separating at least some of the organic flocculent, the insoluble inorganic substances, and the biological substances from the effluent by sedimentation;

(f) decomposing hydrogen peroxide which may have been carried into the effluent by said raising oxygen gas;

(g) aerating and agitating the effluent to eliminate volatile oxidized products and any remaining hydrogen peroxide therefrom; and

(h) filtering the effluent to eliminate any turbidity therefrom.

4,612,125
METHOD FOR REMOVING HEAVY METAL FROM WASTEWATER STREAMS

Geraldine S. Elfline, Morrison, Ill., assignor to CX/Oxytech, Inc., Yorkville, Ill.

Filed Jun. 20, 1985, Ser. No. 747,008

Int. Cl.⁴ C02F *1/52*

U.S. Cl. 210—724 **4 Claims**

1. A method of treating a heavy metal-bearing wastewater to remove a substantial portion of the heavy metal therefrom without substantial sludge formation comprising:

contacting said wastewater with a water soluble tri-thio carbonate in an amount sufficient to react with said heavy metal and cause precipitation of a substantial portion of the heavy metals in the wastewater, and separating the percipitate from the wastewater.

4,612,126
CLARIFYING FILTERING CENTRIFUGE AND METHOD OF USE

Christian Alt, Munich; Arthur Köber, Lochham, and Willi Kiesewetter, Esslingen, all of Fed. Rep. of Germany, assignors to Dr. M, Dr. Müller AG, Männedorf, Switzerland

Filed Sep. 30, 1982, Ser. No. 432,394

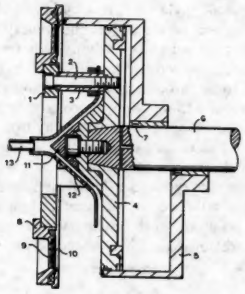
Claims priority, application Switzerland, Oct. 19, 1981, 6660/81

Int. Cl.⁴ B01D *29/04, 29/42*

U.S. Cl. 210—787 **10 Claims**

1. A method of separating solid particles from suspension having coarse and fine solid particles in a clarifying filtering centrifuge formed as a single rotor with an inner chamber limited by a rear wall extending normal to an axis of rotation, a peripheral wall extending axially and being radially spaced from the axis of rotation, and a front wall provided with a filter element with a filtering surface extending normal to the axis of rotation, the method comprising the steps of supplying the suspension into said chamber in a first axial direction; accelerating the axially supplied suspension by a distributing cone having a surface which is located at an angle relative to the axis so as to deflect the axially supplied suspension radially at said angle so as to superpose an axial stream on a rotary stream; radially deflecting the accelerated suspension normal to said axis over said rear wall toward said peripheral wall, so that the

coarse solid particles of the suspension deposit on said peripheral wall; and thereafter axially deflecting a liquid of the suspension with the fine solid particles over the deposited coarse solid particles in a second axial direction which is opposite to said first axial direction toward said filter element so that the fine solid particles of the suspension deposit on said filter element, while the liquid of the suspension flows axially through



said filter element outwardly of the rotor; and arranging an inlet funnel having a conical portion and a radial portion so that said conical portion extends at a distance from and parallel to said surface of said distributing cone and said radial portion extends at a distance from and parallel to said rear wall so as to prevent spraying off of the suspension, the suspension being supplied through said inlet funnel.

4,612,127

LUBRICANT FOR METAL FORMING AND PROCESS FOR METAL FORMING

Takao Uematsu, Hitachi; Shigeki Komatsuzaki, Mito; Tomoe Takamura; Fumio Nakano, both of Hitachi, and Toshikazu Narahara, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,686

Claims priority, application Japan, Sep. 28, 1983, 58-179752; Dec. 16, 1983, 58-238517

Int. Cl.[4] C10M *137/06*

U.S. Cl. 252—32.5 **18 Claims**

1. A substantially water-free, liquid lubricant for metal forming, which comprises a lubricating oil and at least one condensed phosphorus compound selected from the group consisting of linearly condensed phosphorus compounds represented by the following general formula (1):

$$M_mH_{n+2-m}P_nO_{3n+1} \quad (1)$$

wherein m is an integer of 0, 1, . . . , n+1, n is an integer of 2 to 6, and M is an alkali metal, and cyclically condensed phosphorus compounds represented by the following general formulae (2) and (3):

$$(HPO_3)_n \quad (2)$$

$$M_xH_y(PO_3)_{x+y} \quad (3)$$

wherein n is an integer of 2 to 8, M is an alkali metal, and each of x and y is an integer of 1 or more, where $x+y \leqq 8$ and wherein 2 to 20 parts by weight of the condensed phosphorus compound is present per 100 parts by weight of the lubricating oil.

4,612,128

LUBRICANT FOR PLASTIC WORKING OF METALS

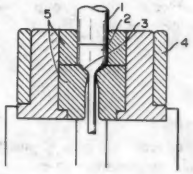
Takao Uematsu; Hiroshi Suzuki, both of Hitachi; Shigeki Komatsuzaki, Mito, and Fumio Nakano, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,899

Claims priority, application Japan, Oct. 3, 1984, 59-206333; Oct. 11, 1984, 59-211337

Int. Cl.[4] C10M *137/04*

U.S. Cl. 252—32.5 **24 Claims**



1. A lubricating composition suitable for metal forming comprising:

(a) a lubricating oil,

(b) at least one phosphite ester of pentaerythritol, and

(c) at least one compound selected from the group consisting of phosphate monoesters, phosphate diesters and phosphonates.

4,612,129

SULFUR-CONTAINING COMPOSITIONS, AND ADDITIVE CONCENTRATES AND LUBRICATING OILS CONTAINING SAME

Stephen A. DiBiase; Kirk E. Davis, both of Euclid, and Thomas A. Tagliamonte, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 31, 1985, Ser. No. 696,839

Int. Cl.[4] C10M *135/18, 133/58*

U.S. Cl. 252—33.6 **40 Claims**

1. An oil-soluble composition which comprises

(A) at least one metal salt of at least one dithiocarbamic acid of the formula

$$R_1(R_2)N—CSSH \quad (I)$$

wherein R_1 and R_2 are each independently hydrocarbyl groups in which the total number of carbon atoms in R_1 and R_2 is sufficient to render the metal salt oil-soluble and

(B) at least one oil-soluble sulfurized organic compound, wherein the weight ratio of (A) to (B) is in the range from about 1:10 to about 50:1; and

(C) at least one auxiliary corrosion-inhibitor in the form of an oil soluble derivative of a dimercaptothiadiazole wherein the weight ratio of (C) to the mixture of (A) and (B) is from about 0.001:1 to about 0.5:1.

4,612,130

ORGANOMETALLIC COMPOSITIONS USEFUL AS LUBRICATING OIL ADDITIVES

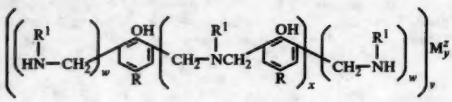
James F. Landry, La Habre; Michael C. Croudace, Huntington Beach; Harry P. On, Jr., La Habre, and Sidney Y. Shen, Hacienda Heights, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 18, 1985, Ser. No. 693,003

Int. Cl.[4] C10M *133/04, 139/00*

U.S. Cl. 252—39 **29 Claims**

1. A composition of matter represented by the general formula:



wherein M is selected from the group consisting of members of Groups IIa, IIb, IIIa, IVa and VIIb of the Periodic System of Elements; R^1 is selected from the group consisting of radicals represented by the formula

wherein R^2 is selected from the group consisting of hydrogen, hydrocarbyl radicals and heteroatom-substituted hydrocarbyl radicals wherein said heteroatoms are selected from the group consisting of halogen, oxygen, sulfur, nitrogen and phosphorus atoms; R^3 is selected from the group consisting of hydrogen and lower alkyl radicals; R is selected from the group consisting of hydrocarbyl radicals and hetero atom-substituted derivatives thereof wherein said heteroatoms are selected from the group consisting of halogen, oxygen, sulfur, nitrogen and phosphorus atoms; and v, w, x, y and z are integers, except that when x is zero at least one w is 1.

4,612,131
STABILIZED RUBBER OR LUBRICANT COMPOSITIONS CONTAINING MERCAPTOALKYL ESTERS OF HINDERED PHENOLS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 548,533, Nov. 3, 1983, Pat. No. 4,532,286, which is a continuation of Ser. No. 371,038, Apr. 23, 1982, abandoned, which is a continuation of Ser. No. 217,364, Dec. 17, 1980, abandoned, which is a division of Ser. No. 127,015, Mar. 4, 1980, abandoned. This application Mar. 21, 1985, Ser. No. 714,648

Claims priority, application Switzerland, Mar. 9, 1979, 2280/79; May 3, 1979, 4141/79

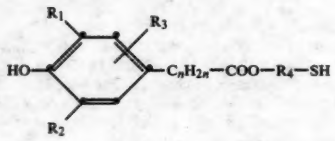
Int. Cl.[4] C10M *129/70*

U.S. Cl. 252—48.6 **2 Claims**

1. A stabilized composition which comprises

(a) a lubricating oil, and

(b) from 0.01 to 5% by weight, based on the stabilized lubricating oil, of a compound of formula I



(I)

wherein

R_1 and R_2 are alpha-branched alkyl of 3 to 8 carbon atoms, R_3 is hydrogen, R_4 is ethylene, 1,3-propylene or 1,4-butylene, and n is 2 or 4.

4,612,132
MODIFIED SUCCINIMIDES

Robert H. Wollenberg, San Rafael; Frank Plavac, Novato, and Timothy R. Erdman, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 632,777, Jul. 20, 1984, abandoned. This application Apr. 12, 1985, Ser. No. 722,939

Int. Cl.[4] C10M *133/44*

U.S. Cl. 252—51.5 A **60 Claims**

1. A polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with a hydroxyhydrocarbyl oxycarbonyl wherein the hydroxyhydrocarbyl group of said hydroxyhydrocarbyl oxycarbonyl contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group is contained in the hydroxyhydrocarbyl group, no more than one hydroxy group is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one greater than the number of hydroxy groups.

4,612,133
STABLE MIXTURES OF CHLOROFLUOROCARBONS AND SOLVENTS AND THEIR USE AS HEAT TRANSFER FLUIDS

Rene Bertocchio, Vourles-par-Vernaison; Bernard Genest, Courbevoie, and Henri Mathais, Saint Didier au Mont d'Or, all of France, assignors to Atochem, Puteaux and Gaz de France, Paris, both of, France

Filed Jul. 3, 1985, Ser. No. 752,167

Claims priority, application France, Jul. 6, 1984, 84 10755; Jul. 6, 1984, 84 10813

Int. Cl.[4] C09K *5/04*

U.S. Cl. 252—68 **13 Claims**

1. A stable heat exchange medium for use in absorption type heat pumps, which medium comprises from ten to sixty percent by weight of the composition of a chlorofluoro-hydrocarbon heat exchange fluid, amide or glycol-ether solvent, and an from 0.05 to 2.5 percent of the weight of the solvent of at least one metal salt of an alkylarylsulfonate to stabilize the fluid against thermal decomposition.

2. A heat exchange medium according to claim 1 wherein the metal salt has the formula $(R_m\text{-Ar-}SO_3)_nM$, where R is a straight-or branched-chain alkyl group containing from one to 15 carbon atoms, m is one, two, or three, Ar is an aromatic group containing one or more aromatic rings, M is a metal atom, and n is an integer corresponding to the valence of the metal.

4,612,134
POLYALKYLHYDROSILOXANES AS INORGANIC SILICATE STABILIZERS

Richard A. Pierce, and Robert T. Jernigan, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1985, Ser. No. 763,572

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—75 **4 Claims**

1. A gelation resistant glycol composition comprising:

(a) an alkylene glycol, an alkylene glycol ether or mixtures thereof,

(b) an amount of an inorganic silicate effective to reduce corrosion, and

(c) an amount, effective to resist gelation, of a glycol soluble organosiloxane polymer having the formula

$$Me_3Si—O—[Si(Me)_2—O]_x—[SiHMe—O]_y—SiMe_3$$

where the ratio of x to y is from 0 to about 10.

4,612,135

ALL-PURPOSE SANITARY CLEANING COMPOSITION

George Wenzel, New Milford, Conn., assignor to Sanitary Products Corp., West Haven, Conn.

Continuation of Ser. No. 520,626, Aug. 5, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,578
Int. Cl.[4] C11D *3/43, 3/48*
U.S. Cl. 252—106 5 Claims

1. A sanitary cleaning composition comprising
about 0.12 to 20% by weight phosphoric and,
about 0.04 to 9% by weight oxalic acid,
about 0.1 to 17% by weight of a non-ionic surfactant having the structure $R—(O—CH_2OCH_2)_n$ wherein R is an alkyl-aryl radical and n is an integer from about 1 to 20
about 0.03 to 0.3% by weight of a cationic surfactant comprising fluorinated alkyl quaternary ammonium iodide having an alkyl group of 4 to 16 carbon atoms
about 0.14 to 44% by weight of an alkylene glycol monoalkyl ether solvent having the structure $HOCH_2CH_2OR$ wherein R is lower alkyl, and
about 0.006 to 1.7% of an odor masking agent; and the balance water, and with the proviso that the phosphoric acid be present in an amount in excess of the oxalic acid.

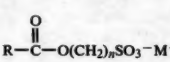
4,612,136

SURFACTANT COMPOSITIONS AND RELATED PROCESSES AND PROCEDURES

Mario Novakovic, Kew Garden Hills, N.Y., and Phillip G. Abend, Fairlawn, N.J., assignors to Finetex, Inc., Elmwood Park, N.J.

Filed Apr. 3, 1985, Ser. No. 720,071
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—134 13 Claims

1. A process that comprises admixing an acyloxy alkane sulfonate salt of the formula:



wherein R is a hydrocarbyl radical, n is an integer of from 2 to 4 inclusive, and M is an alkali metal, with a polyol and water wherein said sulfonate salt is present in an amount by weight of about 44 percent to about 56 percent, said polyol is present in an amount by weight of about 2 percent to about 6 percent, and water is present in an amount by weight of about 26 to about 36 percent, and heating said mixture under superatmospheric pressure for a period of time sufficient to form, upon cooling, a reversible solid colloidal solution.

4,612,137

ANTI-YELLOWING DETERGENT COMPOSITION CONTAINING CITRATE AND ISOCITRATE

Mutsumi Kuroda, and Moriyasu Murata, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,888
Claims priority, application Japan, Sep. 3, 1984, 59-183951
Int. Cl.[4] C11D *3/04, 3/20, 3/37, 3/60*
U.S. Cl. 252—174.19 8 Claims

1. A detergent composition, comprising:
from 1 to 50 percent by weight of (a) citric acid or salt thereof, and (b) isocitric acid or salt thereof, wherein the weight ratio of (a) to (b) is from 90:10 to 40:60; and
from 10 to 40 percent by weight of surfactant.

5. A detergent composition, comprising:
from 1 to 50 percent by weight of a mixture of (a) citric acid or salt thereof, and (b) isocitric acid or salt thereof, wherein the weight ratio of (a) to (b) is from 19:1 to 40:60;
from 0.1 to 5 percent by weight of polyethylene glycol having an average molecular weight of 1000 to 20000; and
from 10 to 40 percent by weight of surfactant.

4,612,138

STABLE ACIDIC AND ALKALINE METAL OXIDE SOLS

Bruce A. Keiser, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 4, 1983, Ser. No. 520,390
Int. Cl.[4] C04B *35/26;* B01J *13/00*
U.S. Cl. 252—313.2 11 Claims

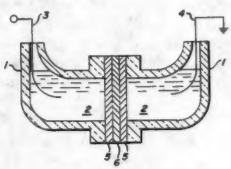
1. A stable alkaline metal oxide sol having a pH of at least 8.0 containing from 1–50 weight percent M_xO_y, wherein:
M is chosen from the group consisting of alkaline earth metals and transition metals;
x is from 1–3;
y is from 1–6; and
a water-soluble stabilizing component chosen from the group consisting of water-soluble surfactants having an HLB greater than about 8.0, water-soluble dispersing carboxylate polymers and mixtures thereof, with the ratio of metal oxide to stabilizing component being within the range of 0.25:1 to about 20:1 and the pH of the alkaline metal oxide sol being produced by a water-soluble amine.

4,612,139

SEMI-CONDUCTIVE POLYOLEFIN COMPOSITIONS AND CABLES COVERED WITH SAME

Youichi Kawasaki, and Kenji Igarashi, both of Yokohama, Japan, assignors to Nippon Unicar Co. Limited, Tokyo, Japan

Continuation of Ser. No. 333,846, Dec. 23, 1981, abandoned. This application May 17, 1984, Ser. No. 610,416
Claims priority, application Japan, Jan. 30, 1981, 56-12605
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 13 Claims



1. A semi-conductive composition consisting essentially of a polyolefin, carbon black in an amount of about 5 to about 60 percent by weight based on the weight of the total composition and a polyethylene glycol having a molecular weight of about 1,000 to about 20,000, in an amount of 0.1 to 20 percent by weight based on the weight of the polyolefin.

4,612,140

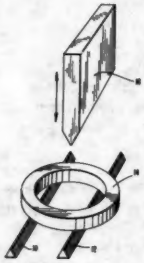
NON-LINEAR ELECTRICAL RESISTOR HAVING VARISTOR CHARACTERISTICS

Haruhumi Mandai, Osaka; Kazutaka Nakamura, Kyoto; Yasuyuki Naito, Kyoto, and Kiyoshi Iwai, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,359
Claims priority, application Japan, Apr. 8, 1983, 58-62790
Int. Cl.[4] H01B *1/06;* C04B *35/46*
U.S. Cl. 252—520 13 Claims

1. A non-linear electrical resistor consisting essentially of strontium titanate and 0.1 to 1.0 mol % of Er_2O_3, Ho_2O_3 or mixtures thereof, said non-linear electrical resistor having

varistor characteristics and having a granular crystalline structure wherein the grains of said structure are semiconductors



and the grain boundaries of said structure have a higher electrical resistance than said grains.

4,612,141

PAINT REMOVING CLEANING COMPOSITIONS

Dolph Faurote, Jr., and Dolph Faurote, III, both of 9218 Balcmes Club Dr., Austin, Tex. 78750

Filed Jul. 1, 1985, Ser. No. 750,134

Int. Cl.[4] C11D *1/62, 3/18, 3/48*

U.S. Cl. 252—546 **2 Claims**

1. An aqueous cleansing composition effective for removal of paints, varnishes and the like from fabric articles such as carpet consisting essentially of by volume about 9.4 parts naphtha, about 0.17 parts alkyl dimethyl benzyl ammonium chloride, about 0.02 parts ethyl alcohol, about 0.008 parts tetrasodium ethylenediaminetetraacetate, about 3.125 parts ammonia, 0.12 to 3.5 parts pine oil, and water to make 100 parts.

4,612,142

ETHER SULFONATES AS LOW-FOAM WETTING AGENTS

Robert Piörr, Ratingen-Hoesel; Hildegard van Delden, Hilden; Sabine Lüttge, Monchen-Gladbach; Bernd Bühr, Neuss, and Ingo Wegener, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,827

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433593

Int. Cl.[4] C11D *1/28*

U.S. Cl. 252—555 **5 Claims**

1. In an aqueous composition for the treatment of a solid surface wherein such composition has a pH below 3 or above 10 and wherein such composition contains a wetting agent, the improvement wherein said wetting agent is an effective amount of an ether sulfonate of the formula

$$R^1—O(C_nH_{2n}O)x—R^2—SO_3M \quad (I)$$

in which R_1 is a C_1–C_6 alkyl group, n is an integer of from 2 to 4, x is an integer of from 0 to 30, R_2 is a C_6–C_{22} linear alkenylene, hydroxyalkylene, or hydroxyalkenylene group, and M is hydrogen or an alkali metal cation.

4,612,143

PROCESS FOR THE PREPARATION OF FLUOROFORMATES

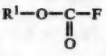
Marc Piteau, Itteville; Jean-Pierre Senet, La Chapelle la Reine; Patrick Wolf, Vert le Petit, all of France; Roy A. Olofson, and Vu A. Dang, both of State College, Pa., assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Sep. 17, 1984, Ser. No. 651,661

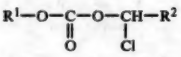
Int. Cl.[4] C07C *68/06*

U.S. Cl. 558—282 **17 Claims**

1. A process for the preparation of fluoroformates of formula:



wherein R^1 is an unsubstituted saturated or unsaturated, aliphatic, cycloaliphatic or polycyclic radical of up to 24 carbon atoms, a saturated or unsaturated aliphatic, cycloaliphatic or polycyclic radical of up to 24 carbon atoms substituted by an hydrocarbon radical or by at least one halogen atom, araliphatic radical of up to 24 carbon atoms which is unsubstituted or substituted by an hydrocarbon radical or by at least one halogen atom, or an aromatic radical of up to 24 carbon atoms, which consists of reacting a carbonate of formula:



wherein R^1 has the same meaning as hereinabove and R^2 is hydrogen, alkyl of 1–12 carbon atoms, cycloalkyl of 5–12 carbon atoms, saturated or unsaturated, unsubstituted or substituted by one or more halogen atoms or R^2 is aryl, unsubstituted or substituted by one or more halogen atoms, with 1–5 equivalents of an alkali or alkaline earth fluoride, ammonium fluoride or a quaternary ammonium fluoride of formula $FNR^3R^4R^5R^6$, wherein R^3, R^4, R^5 and R^6 are the same or different and are hydrogen, alkyl or aralkyl of 1–12 carbon atoms or a fluoride which is a member selected from the group consisting of KHF_2, NH_4HF_2 or KSO_2F, said fluoride being activated by 1–10% by weight of a complexing agent for the cation in the fluoride which is a cryptate, a cyclic or linear polyether or being activated by a polar aprotic compound, at a temperature between 20° and 120° C., whereby said carbonate is split to give a reaction mixture containing an aldehyde of formula R_2CHO and said fluoroformate, separating from the reaction mixture at least one of said fluoroformate and said aldehyde as soon as formed and recovering said fluoroformate.

4,612,144

METHOD OF MAKING LIGHT GUIDE MEMBER

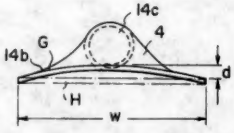
Yutaka Taniguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1984, Ser. No. 601,200

Claims priority, application Japan, Apr. 18, 1983, 58-67978

Int. Cl.[4] B29C *53/04*

U.S. Cl. 264—1.5 **8 Claims**



1. A method of making a light guide member composed of transparent thermoplastic material and having a flat plate-like

shape at one end portion and an approximately cylindrical shape at the other end portion, the method comprising the steps of:

(i) bending a flat plate-like transparent thermoplastic material by holding one end portion in a position so that the middle section of said one end portion is convex,

(ii) heating and softening said transparent thermoplastic material,

(iii) rounding the other end portion of said transparent thermoplastic material cylindrically in the same direction as the bending direction of said one end portion of said transparent thermoplastic material; and

(iv) allowing said thermoplastic material to cool gradually,

(v) whereby said one end portion of said thermoplastic material has a substantially flat plate-like shape after the gradual cooling.

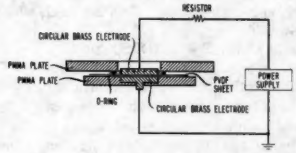
4,612,145
METHOD FOR PRODUCING ELECTRET-CONTAINING DEVICES

Harvey D. Keith, Summit; Heinz von Seggern, Westfield; Tsuey T. Wang, Summit, and James E. West, Plainfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 26, 1984, Ser. No. 593,619

Int. Cl.[4] B29C *71/04, 13/08*

U.S. Cl. 264—22 **9 Claims**



1. A method for fabricating a device, comprising the steps of:

at least partially fabricating said device; and

further fabricating said device by applying a voltage across an electrically polarizable body to produce a polarization, or an increased degree of polarization, in said body which persists after removal of said voltage, Characterized In That

said method further comprises the steps of reducing the voltage across at least a portion of said body undergoing polarization in response to a current indicating the onset of a breakdown in said body, and discontinuing the application of a voltage to said body after a finite time period of sufficient duration to produce said polarization or increased degree of polarization, said voltage reduction being effected with an apparatus positioned in the path of said current and exhibiting an impedance which is chosen, in relation to material properties and dimensions of said body, to both reduce said applied voltage in response to said current and to achieve a duration of said finite time period which is sufficiently small that either said time period does not limit the rate at which said device is fabricated or is substantially minimized.

4,612,146
PROCESS FOR THE HOT-ISOSTATIC COMPRESSION OF CERAMIC SHAPED PARTS

Werner Huther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,781

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323509

Int. Cl.[4] C01B *31/00*

U.S. Cl. 264—29.6 **13 Claims**

1. A process for the manufacture of a shaped ceramic part comprising applying a resin coat on a preform of silicon nitride or silicon carbide, heating the resin coat to form a gas impermeable coating of amorphous carbon therefrom on said preform, hot-isostatically compressing the preform with the amorphous carbon coating thereon to form a shaped ceramic part with the amorphous carbon coating, and then burning off the amorphous carbon coating.

4,612,147
PROCESS FOR THE MANUFACTURE OF HYDROPHILIC POLYESTER FIBERS

Herbert Haubold, Wörth, and Bernhard Burg, Wuppertal, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Feb. 14, 1984, Ser. No. 579,651

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305798

Int. Cl.[4] D01F *1/02, 1/07*

U.S. Cl. 264—46.1 **7 Claims**

1. A process for the manufacture of hydrophilic polyester fibers comprising the steps of (1) spinning of a polyester mass containing 1 to 20% by weight of one or several oxalato complexes of the general formula

$$Me_n[Z(C_2O_4)_m]$$

wherein

Me is an ion selected from the group consisting of Li, Na, K, Rb, Cs or NH_4;

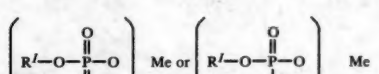
Z is a complex-forming central atom selected from the group consisting of Mg, Ca, Sr, Ba, Zr, Hf, Ce, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, B, Al, Ga, In, Sn, Pb and Sb;

n is ~1, ~2 ~3, or ~4; and

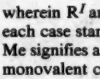
m is ~2, ~3 or ~4;

(2) drawing of the resulting yarn; and (3) hydrosetting the yarn in the presence of liquid water at temperatures of 90° to 170° C., whereby the fact that hydrosetting is carried out in the presence of at least one surfactant, selected from the group consisting of

(a) Salts, soluble in water or dispersible in water, of partial esters of phosphoric acid, of the general formulas



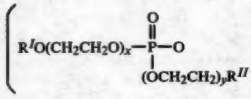
wherein R^I and R^{II} may be the same, or different and, in each case stand for an alkyl radical with 2 to 20 C atoms, Me signifies a mono- or multivalent cation of a metal, or a monovalent cation of the general formula



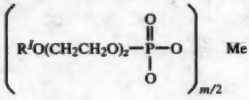
whereby the radicals R_1 to R_4 may be the same, or differ-

ent, and in each case signify hydrogen, an alkyl radical with 1 to 20 C atoms, or a radical of the formula $(CH_2CH_2—O)_rR_5$, in which r may have values from 1 to 20 and R_5 is a hydrogen atom or an alkyl radical, while m is the valence of the metal cation Me;

(b) Salts, soluble or dispersible in water, of partial esters of phosphoric acid, of the general formula

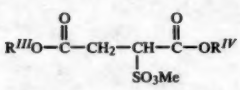


or



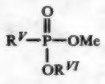
whereby R^I, R^{II} and Me have the meaning defined above, and x and y may be the same, or different, and may have values from 0 to 20, but x+y are at least equal to 1, and z has a value from 1 to 20;

(c) Alkali salts, soluble or dispersible in water, of sulfosuccinic acid, of the general formula



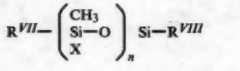
whereby R^{III} and R^{IV} are the same, or different, and in each case signify an alkyl radical of 6 to 20 C atoms, and Me is an alkali metal;

(d) Alkali salts, soluble or dispersible in water, of phosphonic esters of the general formula



whereby R^V is an alkyl radical with 2 to 12 C atoms and R an alkyl radical with 1 to 12 carbon atoms and R^V and R^{VI} may be the same, or different, while Me is an alkali metal;

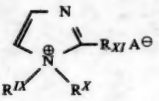
(e) Silicone compounds, soluble or dispersible in water, of the general formula



whereby R^{VII} and R^{VIII} may be the same, or different, and in each case signify an alkyl radical with 1 to 10 carbon atoms, or a radical of the general formula $(CH_2CH_2O)_m—R_6$, whereby m=1 to 5 and R_6 is hydrogen or an alkyl radical, while 10 to 90% of all X are a methyl group, and 90 to 10% a radical of the general formula $(CH_2CH_2O)_tH$, wherein t may assume values from 1 to 20, and may be the same, or different, for all radicals X and exhibits n values, so that the molecular weight of the silicone compound is between 300 and 10,000;

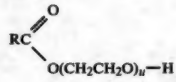
(f) Ethoxylated fatty alcohols, soluble or dispersible in water, of the formula $R—O(CH_2CH_2O)_xH$, wherein R signifies an alkyl radical with 8 to 22 carbon atoms, and x may have a value from 1 to 20;

(g) Imidazole salts, or salts of partly or completely hydrogenated imidazoles, soluble or dispersible in water, of the general formula



wherein R^{IX} and R^{XI} may be the same, or different, and signify an alkyl group with 1 to 20 C atoms, and R^X signifies an alkyl group with 1 to 10 carbon atoms or a radical of the general formula $(CH_2CH_2O)_sH$, in which s may have values from 1 to 20 while $A^\ominus$ is the anion of a monovalent, inorganic or organic acid, or the monovalent anion of a multivalent, partly esterified inorganic or organic acid no longer exhibiting any acid functions;

(h) Fatty acid polyglycol esters, soluble or dispersible in water, of the general formula



wherein R is an alkyl radical with 8 to 22 carbon atoms, and μ may exhibit a value from 1 to 20.

4,612,148

PROCESS FOR PRODUCING STRETCHED ARTICLES OF ULTRAHIGH-MOLECULAR-WEIGHT POLYETHYLENE

Masanori Motooka, Yamaguchi; Hitoshi Mantoku, Iwakuni, and Takao Ohno, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 566,302, Dec. 28, 1983, Pat. No. 4,545,950. This application Jul. 16, 1985, Ser. No. 755,590

Claims priority, application Japan, Dec. 28, 1982, 57-227447; Apr. 7, 1983, 58-59976

Int. Cl.[4] D01F *1/10*; D01D *5/088*

U.S. Cl. 264—49 **7 Claims**

1. A process for producing a stretched article of ultrahigh-molecular-weight polyethylene, which comprises,

(1) melt-kneading a mixture composed of (A) 15 to 80 parts by weight, per 100 parts by weight of the components (A) and (B) combined, of ultrahigh-molecular-weight polyethylene having an inherent viscosity (η), determined at 135° C. in decalin, of at least 5 dl/g and (B) 85 to 20 parts by weight, per 100 parts by weight of the components (A) and (B) combined, of a paraffinic wax having a melting point, determined by the DSC method, of 40° to 120° C. and a weight average molecular weight ($\overline{Mw}$), determined by the GPC method, of at least 230 but less than 2,000 in a screw extruder while maintaining the temperature of the mixture at 180° to 280° C.,

(2) melt-extruding the molten mixture through a die kept at a temperature of 180° to 300° C., under a draft condition of a draft ratio of less than 2 or in the absence of a draft,

(3) cooling the resulting unstretched extrudate to solidify it, and

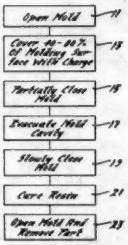
(4) subjecting the unstretched solidified extrudate to a stretching treatment at a temperature of 60° to 140° C. at a stretch ratio of at least about 3:1 when the step (2) is carried out while a draft is applied to the unstretched extrudate or at a stretch ratio of at least about 10:1 when step (2) is carried out in the absence of a draft, said stretching treatment is carried out in a heated liquid medium which is a solvent for the paraffinic wax (B) whereby the paraffinic wax (B) is extracted from the extrudate simultaneously with the stretching treatment, such that the

amount of the wax (B) remaining in the stretched articles is not more than about 10% by weight.

4,612,149
COMPRESSION MOLDING A CHARGE USING VACUUM

Kenneth A. Iseler, Richmond, and Robert E. Wilkinson, Birmingham, both of Mich., assignors to The Budd Company, Troy, Mich.

Filed Aug. 13, 1984, Ser. No. 640,470
Int. Cl.[4] B29C *43/56*
U.S. Cl. 264—101 **6 Claims**



1. A method of making an automotive part having a surface area of at least about two square feet and providing the part with a smooth surface by compression molding a charge containing a curable resin, said method comprising:

a. opening a mold having an upper die and a lower die with opposing molding surfaces that cooperate to define a mold cavity having a shape corresponding to the desired shape of the part;

b. placing the charge on the molding surface of one of the dies so that the charge covers 40%–80% of the surface area of the molding surface;

c. moving the dies toward each other to a partially closed condition where the mold cavity is essentially defined but the other die remains spaced from the charge;

d. evacuating the mold cavity;

e. closing the mold so that the dies compress the charge to cause it to fill the mold cavity;

f. allowing the resin to cure; and

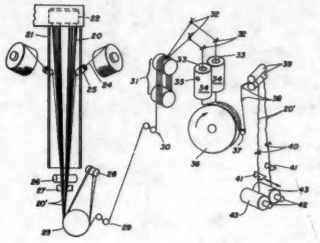
g. opening the dies and removing the part without applying a coating to the part while in the mold.

4,612,150
PROCESS FOR COMBINING AND CODRAWING ANTISTATIC FILAMENTS WITH UNDRAWN NYLON FILAMENTS

Jack R. De Howitt, Camden, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1983, Ser. No. 555,513
Int. Cl.[4] D02G *3/12*
U.S. Cl. 264—103 **4 Claims**

1. A process for producing a carpet yarn with reduced static propensity comprising melt spinning a plurality of nonconductive nylon filaments into a quench chimney, pneumatically introducing spin-oriented electrically conductive bicomponent filaments into the freshly spun threadline within the quench chimney, consolidating the combined yarn at a puller roll,

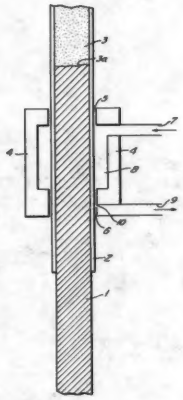


drawing and cobulking the combined yarn and then winding up the yarn.

4,612,151
METHOD FOR CONTINUOUS PRODUCTION OF ELONGATED CARBON BODIES

William V. H. Bruff, and Leif Olsen, both of Vågsbygd, Norway, assignors to Elkem a/s, Oslo, Norway

Filed Nov. 5, 1984, Ser. No. 668,492
Claims priority, application Norway, Dec. 2, 1983, 834453
Int. Cl.[4] C04B *35/00*; H05B *7/094*
U.S. Cl. 264—105 **16 Claims**



1. A method for continuous production of elongated carbon bodies having a substantially uniform cross-section wherein a casing filled with unbaked carbonaceous electrode paste and a binder is slowly and continuously or substantially continuously lowered down through a baking furnace having an external energy supply, said method comprising:

providing a perforated casing;

filling said perforated casing with unbaked carbonaceous electrode paste and a binder;

heating said electrode paste thereby causing baking gases to evolve from the electrode paste and flow through the perforations in the casing into the baking furnace;

supplying air to the baking furnace in an amount sufficient for combustion of the baking gases which flow into the baking furnace from the electrode paste; and

adjusting the external supply of energy to the baking furnace in such a way that the total amount of external supplied energy and energy generated by combustion of the baking

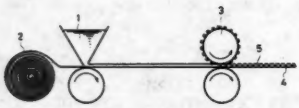
gases is sufficient to maintain a temperature in the baking furnace between 700° and 1300° C.

4,612,152

METHOD FOR PRODUCTION OF WATER-PROOFING SHEET

Kazuhisa Kawabata, Chiba; Hirohide Kumabe, Kanagawa, and Shunzo Kawai, Chiba, all of Japan, assignors to Daiawa Kobunshi Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,256
Int. Cl.[4] B29C 47/06
U.S. Cl. 264—136 1 Claim



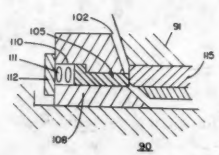
1. A method for production of water-proofing sheets, which comprises mixing 17–25 weight parts of thermoplastic rubber of SBS or SBSB block copolymer of butadiene-styrene with 100 weight parts of asphalt, and shaping the rubberized asphalt thus obtained into sheet having grooves connected with each other on its surface.

4,612,153

PROCESS AND APPARATUS FOR THERMOFORMING A THERMOPLASTIC CARTON HAVING AN APERTURE THEREIN FOR LATCHING THE COVER

Raj K. Mangla, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,163
Int. Cl.[4] B29C 67/20, 51/08
U.S. Cl. 264—154 18 Claims



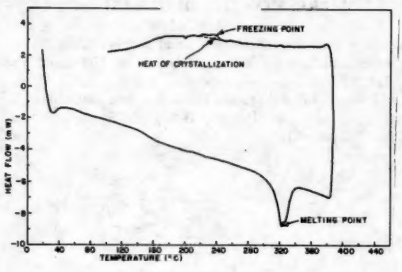
1. In a method for forming an aperture in a sheet of plastic resin material during a thermoforming moulding process by moulding the sheet at an elevated temperature between male and female die members which are capable of being moved from an open position to a closed, moulding position, the improvement which comprises forming the aperture in a three-dimensional configuration in the material by shearing the sheet at an elevated temperature by means of cooperating shear members on the die members, the shear members having three cooperating shear faces which extend in the relative direction of movement of the die members and in two dimensions in a plane extending perpendicular to the direction of die movement.

4,612,154

SPINNING OF CERTAIN HIGH MOLECULAR WEIGHT ANISOTROPIC MELT FORMING POLYESTERS

Joseph Zimmerman, Greenville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 15, 1984, Ser. No. 621,192
Int. Cl.[4] D01D 5/10; C08G 63/18
U.S. Cl. 264—176.2 3 Claims



1. A melt-spinning process comprising

a. selecting an aromatic polyester capable of forming an anisotropic melt, said polyester having a melting point below about 335° C., a heat of crystallization equal to or less than 10 J/g and a molecular weight sufficiently high so as to cause pulsations and result in nonuniform filaments when spun above the melting point,

b. melting and maintaining the polymer at a temperature at least 10° C. above its melting point, and

c. spinning the polymer through a spinneret orifice of about 25 mils or less in diameter, at a spinneret temperature of at least 240° C. and above the freezing point of the polymer but below its melting point.

4,612,155

PROCESS FOR THE GRAFTING OF MONOMERS ONTO POLYOLEFINS

Chun S. Wong, and Ronald A. Zelonka, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Jul. 18, 1985, Ser. No. 756,176
Int. Cl.[4] C08L 51/06, 23/26
U.S. Cl. 264—176 R 24 Claims

1. A continuous process for the grafting onto a polyolefin of an ethylenically unsaturated monomer that is capable of reacting with said polyolefin in a molten condition, said polyolefin being selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_4–C_{10} higher alpha-olefins, and mixtures thereof, said process comprising:

(i) feeding a physical admixture to an extruder equipped with a mixing screw, said physical admixture being comprised of (a) a major portion of particles of a polyolefin, (b) a minor portion of particles of a second polymer, (c) said monomer and (d) 125–400 ppm of an organic peroxide having a half life of from about one minute to about 120 minutes at 150° C., said polyolefin being the polyolefin defined above and said second polymer being a normally solid thermoplastic polymer selected from the group consisting of:

(A). homopolymers and copolymers consisting of unsaturated hydrocarbons;

(B). copolymers of an alpha-olefin having the formula $R—CH=CH_2$, wherein R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, with alpha,beta-ethylenically unsaturated acids having from 3 to 8 carbon atoms, and esters and anhydrides thereof, such acids being mono-, or di- or polycarboxylic acids, the moieties being ran-

domly or non-randomly distributed in the polymer chain and being 0.5–50% by weight of the copolymer, any other copolymerized monomer being monoethylenically unsaturated;

(C). ionomeric polymers derived from the copolymers of (B);

(D). graft copolymers obtained by grafting 0.1 to 5 percent by weight of alpha-beta unsaturated carboxylic acids having 3 to 8 carbon atoms or an unsaturated carboxylic acid anhydride onto a preformed backbone derived from ethylene or ethylene and C_3 to C_8 alpha-olefin, in which polyolefin backbone any other optionally copolymerized monomer component is monoethylenically unsaturated;

(E). homopolymers of R'—CH=CH—R' were each R' is independently selected from the group consisting of H, Cl and F, with the proviso that at least one R' is other than H, copolymers of ethylene with R'—CH=CH—R' and chlorinated homopolymers and copolymers of C_2–C_{10} hydrocarbon alpha-olefins;

(F). saturated polyamides and polyesters;

(G). homopolymers of vinyl esters of aliphatic carboxylic acids having 3 to 8 carbon atoms, copolymers of ethylene with such esters, and partially saponified polymers thereof; and

(H). copolymers of (B) in which all or part of the alpha-olefin has been replaced with styrene or alkyl styrene, where the alkyl group has 1 or 2 carbon atoms, and having a meltin point of less than 185° C/ and a shear viscosity that is not more than 50% of that of said polyolefin when measured at 200° C. and a shear rate of 400 sec^{-1}, said organic peroxide being in the form of a composition with the second polymer,

(ii) mixing said admixture in the extruder at a temperature in the range of from the melting point of said polyolefin to 195° C. for a period of time such that the amount of decomposition of the organic peroxide is less than about 25%, said period of time being at least ten seconds,

(iii) mixing the resultant admixture in a second zone of the extruder at a temperature above the melting point of the polyolefin and second polymer for a period of time that is at least four times the half-life of the peroxide, and

(iv) extruding the grafted polymer so obtained into a shaped article.

4,612,156

SOLVENTLESS PROCESS FOR PRODUCING RESINOUS MATERIALS

Ben W. Heinemeyer, Lake Jackson, and Sammy D. Tatum, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 706,065, Feb. 26, 1985, abandoned. This application Nov. 19, 1985, Ser. No. 799,689

Int. Cl.⁴ B29F *3/00*

U.S. Cl. 264—176 R **30 Claims**

1. A process for preparing a resinous material which comprises

(I) continuously feeding to an extruder operating at a temperature and pressure sufficient to cause a reaction between components (A) and (B) and for a time sufficient to produce the desired product, the following components either separately or in admixture in any combination

(A) at least one material having an average of more than one vicinal epoxy group per molecule;

(B) at least one material having attached thereto an average of more than one moiety reactive with component (A) per molecule;

(C) a catalytic quantity of at least one catalyst for promoting the reaction between components (A) and (B) with the proviso that if components (A) and (B) are reactive one with the other in the absence of a catalyst, then this component (C) may be omitted, if desired; and

(D) optionally one or more chain terminators; and

(II) and thereafter forming the thus formed resinous material exiting from the extruder to the desired physical form by suitable means; and wherein

(i) components (A) and (B) are employed in quantities which provide a ratio of groups reactive with an epoxy group to epoxy group of from about 0.01:1 to about 5:1;

(ii) component (D) is employed in quantities which provide a ratio of equivalent of component (D) to epoxy equivalent of from about 0:1 to about 0.5:1; and

(iii) when a material is employed which contains at least one epoxy group and at least one group which is reactive with an epoxy group, then it can, if desired, serve as both components (A) and (B).

4,612,157

METHOD FOR PRODUCTION OF HIGH-TENACITY, FINE-DENIER POLYVINYL ALCOHOL FIBER

Tsuneo Genba; Akio Mizobe; Masaki Okazaki, and Isao Sakuragi, all of Okayama, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Jan. 11, 1985, Ser. No. 690,578

Claims priority, application Japan, Jan. 31, 1984, 59-17484

Int. Cl.⁴ D01F *6/14*

U.S. Cl. 264—185 **7 Claims**

1. A method of producing a fine-denier polyvinyl alcohol fiber having a monofilament fineness of 0.05 to 0.5 denier, comprising:

(a) preparing an aqueous spinning solution containing 8 to 14 weight percent of polyvinyl alcohol by dissolving in water:

(i) a polyvinyl alcohol having an average degree of polymerization between 1200 and 3000,

(ii) boric acid or a salt thereof in a proportion of 0.5 to 5 weight percent relative to the polyvinyl alcohol of (i), and

(iii) an acid, wherein the amount of said acid employed is that amount which adjusts the pH of the aqueous spinning solution to ≤ 5;

(b) discharging said spinning solution through a spinneret having an average hole diameter between 0.02 and 0.04 millimeters into a coagulating bath comprising an alkali containing aqueous solution and a dehydrating salt at a bath draft between 10 to 60 percent,

(c) stretching the resulting filament from step (b) at least ten-fold, and

(d) recovering a fine-denier polyvinyl alcohol fiber.

4,612,158

PROCESS FOR CONTROLLING LEAKS BETWEEN THE PRIMARY AND SECONDARY COOLANT LOOPS OF A PRESSURIZED WATER REACTOR SYSTEM

Bobby L. Day, Waldesch, Fed. Rep. of Germany, assignor to Brown Boveri Reaktor GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,560

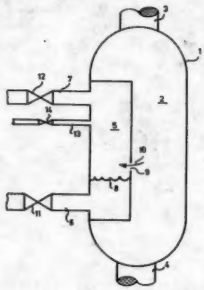
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248029

Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—250 **1 Claim**

1. Process for controlling leaks between the primary and secondary coolant circuits inside a steam generator, having a live steam line and a feedwater line connected to the secondary circuit, of a pressurized water reactor system having at least two steam generators, the process comprises shutting off the live steam line and feedwater line connected to the leaking secondary circuit, and injecting gas to increase the pressure in the secondary circuit of the steam generator above the satura-

tion pressure of water for the temperature present in the steam generator, permitting a pressure equalization between the



primary and secondary circuits with the maintenance of subcooled conditions in the primary circuit.

4,612,159

NUCLEAR FUEL ELEMENT AND PROCESS FOR FABRICATING THE SAME

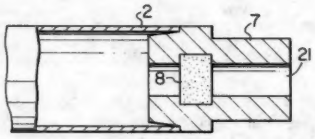
Ryusuke Abe, Hitachi; Makoto Shimizu, Ibaraki, and Yasuo Hirose, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,992

Claims priority, application Japan, Oct. 18, 1982, 57-183458

Int. Cl.⁴ G21C *1/04*

U.S. Cl. 376—351 **4 Claims**



1. A process for fabricating a nuclear fuel element, which comprises welding an end plug to one end of a cladding, filling a plurality of fuel pellets containing plutonium into the cladding, fixing another end plug having a passage provided with a filter for trapping plutonium to another end of the cladding by welding, thereby communicating one end of the passage with the inside of the cladding and the other end with the outside, withdrawing a gas in the cladding through the passage in a state of the end plugs being fixed to both ends of the cladding, then filling an inert gas into the cladding through the passage, and sealing the passage communicating with the outside at a position exteriorly of the filter.

4,612,160

POROUS METAL COATING PROCESS AND MOLD THEREFOR

Alfred L. Donlevy, and Clifford M. Bugle, both of Pittsburgh, Pa., assignors to Dynamet, Inc., Washington, Pa.

Filed Apr. 2, 1984, Ser. No. 595,920

Int. Cl.⁴ B22F *3/10, 7/08;* A61F *2/34;* A61L *27/00*

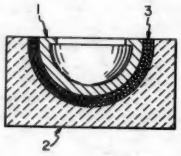
U.S. Cl. 419—2 **21 Claims**

1. A process for producing a porous metal coating on at least a portion of a reactive metal substrate utilizing a rigid mold comprising the steps of:

(a) providing a mold having a cavity of such a size as to receive therein that portion of the metal substrate to be coated with a space between the mold cavity and a surface of the substrate portion to be coated;

(b) disposing the substrate portion to be coated in the mold cavity;

(c) disposing reactive metal powder in the space between the mold cavity and the surface to form an assembly of the mold, the metal powder and the substrate portion;



(d) pre-sintering the assembly to cause the metal powder to adhere to the substrate portion, but not to the mold cavity;

(e) removing the coated substrate portion from the mold; and

(f) further sintering the coated substrate portion, the sintering steps being carried out in a non-reactive atmosphere.

4,612,161

FABRICATION OF METALLIC GLASS STRUCTURES

Carl F. Cline, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 20, 1983, Ser. No. 543,686

Int. Cl.⁴ B22F *3/08*

U.S. Cl. 419—3 **3 Claims**

1. A process for producing a substantially cylindrical solid body of amorphous metallic glass of thickness substantially 0.6 cm or larger and arbitrary length from amorphous metallic glass material in powder or ribbon form, the method comprising the steps of:

providing a rigid metal, hollow cylinder of inside diameter substantially 130–150 percent of the desired diameter of the solid body and of length substantially equal to the desired length of the solid body;

providing sufficient amorphous metallic glass powder or ribbon in the metal hollow cylinder to substantially fill the cylinder interior;

providing a quantity of explosive contiguous to and substantially covering the exterior side wall of the metal

determining the long-term crystallization temperature T_c of the amorphous material, the threshold temperature T_d for plastic deformation of the amorphous material, and the resulting temperature T_r to which the amorphous material will rise in response to detonantion of the adjacent explosive, where T_r is given approximately by

$$T_r = \frac{0.17D^2}{C}\left(\frac{\sqrt{1.185\alpha - 1} - 1}{\sqrt{1.185\alpha + 1} + 1}\right)^2,$$

where D being the detonation velocity of the explosive charge, C being the specific heat of the amorphous material and α being the ratio of active mass of the explosive charge to the mass of the amorphous material;

detonating the explosive so that the detonation wave moves from one end of the cylinder sidewall to the other end and generates a radial, inwardly-directed force to dynamically compact the amorphous metallic glass material and to thereby convert the material to a solid body of amorphous material;

where the quantity of explosive is chosen so that the amor-

phous material under conditions of dynamic compaction reaches a resulting temperature T_r satisfying $T_d \leqq T_r < T_c$.

4,612,162

METHOD FOR PRODUCING A HIGH DENSITY METAL ARTICLE

Ricky D. Morgan, Ulster; Vito P. Sylvester, Athens, and Robert L. Ward, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 11, 1985, Ser. No. 774,849
Int. Cl.[4] B22F *3/24*
U.S. Cl. 419—28 3 Claims

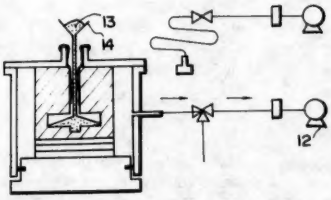
1. In a method for producing a metal article of high density comprising pressing a metal powder at a sufficient pressure to form a green article and sintering said green article at a sufficient temperature for a sufficient time to form a sintered article, the improvement comprising pressing said sintered article at a temperature of at least about 1750° C. for a sufficient time at a pressure of at least about 20,000 psi of a non-oxidizing atmpshere to produce the final high density article, said powder containing at least one of the metal powders of molybdenum and tungsten.

4,612,163

METHOD OF MOLDING POWDERS OF METAL, CERAMIC AND THE LIKE

Hiroaki Nishio; Yasushi Ueno, and Jun Harada, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,578
Claims priority, application Japan, Sep. 4, 1984, 59-183780
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—68 4 Claims



1. A method of molding powders of metals, ceramics and the like comprising the steps of:

closely fitting an opening of a baglike member made of a thin rubber-like elastic material on an open gate of a permeable mold support communicated with a cavity formed within said support to define a mold therein;

reducing the pressure of an atmosphere outside said permeable mold support to evacuate said cavity to such a degree that said baglike member is inflated and adhered to the inside of said cavity in said permeable mold support thereby forming a mold;

packing said mold with a raw material powder;

evacuating said mold to a desired degree of vacuum through the opening of said baglike member and sealing said mold;

dismounting and breaking said permeable mold support to remove a preformed molding in a form contained in said baglike member; and

processing said preformed molding by a cold isostatic press to densify the same.

4,612,164

NICKEL COPPER ALLOYS WITH ENHANCED MALLEABILITY AND IMPROVED SULFIDE DISTRIBUTION

Cecil L. Ramsey, and Francis S. Suarez, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Nov. 1, 1984, Ser. No. 667,010
Int. Cl.[4] C22C *19/03, 9/06*
U.S. Cl. 420—455 5 Claims

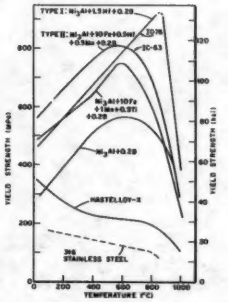
1. A sulfur-containing nickel-copper alloy characterized by good machinability, malleability, and resistance to cracking upon working, said alloy consisting (weight percent) about 20% to 40% copper, sulfur from about 0.01% to 0.075%, cerium and magnesium in small but effective amounts sufficient to enhance resistance to cracking with the cerium and magnesium each being up to about 0.1%, up to 0.3% carbon, up to about 2% of manganese, up to 1% silicon, up to 5% iron, and the balance essentially nickel.

4,612,165

DUCTILE ALUMINIDE ALLOYS FOR HIGH TEMPERATURE APPLICATIONS

Chain T. Liu, Oak Ridge, and James O. Stiegler, Lenoir City, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 21, 1983, Ser. No. 564,108
Int. Cl.[4] C22C *19/00*
U.S. Cl. 420—459 5 Claims



1. An alloy consisting essentially of sufficient nickel and aluminum to form Ni_3Al, an amount of boron sufficient to promote ductility in the alloy and 0.3 to 1.5 atomic percent of an element selected from the group consisting of hafnium and zirconium.

2. The alloy of claim 1 further including 6 to 12 atomic percent iron.

4,612,166

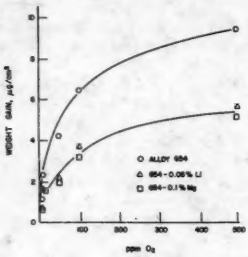
COPPER-SILICON-TIN ALLOYS HAVING IMPROVED CLEANABILITY

Andrew J. Brock, Cheshire; Edward F. Smith, Madison, and Eugene Shapiro, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 15, 1985, Ser. No. 787,341
Int. Cl.[4] C22C *9/02, 9/10*
U.S. Cl. 420—470 8 Claims

1. A copper base alloy exhibiting improved cleanability, said alloy consisting essentially of: from about 1.0% to about 5.0%

tin, from about 1.0% to about 4.5% silicon, an element selected from the group consisting of from about 0.05% to about 0.5%



magnesium and from about 0.01% to about 0.5% lithium, and the balance essentially copper.

4,612,167

COPPER-BASE ALLOYS FOR LEADFRAMES

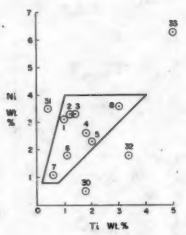
Rikizo Watanabe, Yasugi, and Daizi Sakamoto, Yonago, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,206

Claims priority, application Japan, Mar. 2, 1984, 59-38616; Dec. 28, 1984, 59-279859; Dec. 28, 1984, 59-279860; Dec. 28, 1984, 59-279861

Int. Cl.⁴ C22C *9/06*

U.S. Cl. 420—471 **8 Claims**



1. A copper-base alloy for leadframes consisting essentially of 0.8–4.0 weight % of Ni, 0.2–4.0 weight % of Ti, 0.1–2.0 weight % of Zn, the essential balance being Cu and inevitable impurities, the ratio of Ni to Ti being 1–4.

4,612,168

PROCESS FOR REFINING BRASS AND ALUMINUM SCRAPS

Harold K. Thomas, Phoenix, Ariz., assignor to Corban International, Ltd., Anguilla, West Indies

Filed May 31, 1985, Ser. No. 739,525

Int. Cl.⁴ C22C *1/02*

U.S. Cl. 420—587 **2 Claims**

1. A process for reacting brass and cuprous choloride to separate an elemental copper product and form a molten zinc-copper-aluminum alloy product, comprising the steps of:

(a) contacting solid cuprous chloride with a melt of brass scrap in a chloridizing zone

(i) to convert zinc in the brass scrap to a zinc chloride fume containing a minor amount of cuprous chloride, and

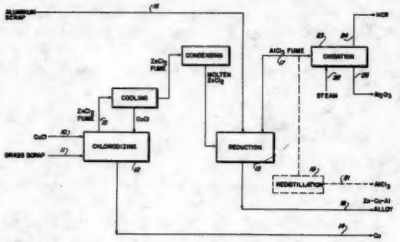
(ii) to form a molten elemental copper product containing the major portion of copper values in the brass scrap and the cuprous chloride;

(b) separating the zinc chloride fume containing cuprous chloride from the molten copper product;

(c) condensing the zinc chloride fume containing cuprous chloride to the molten state;

(d) contacting the molten zinc chloride containing cuprous chloride in a reduction zone with aluminum scrap,

(i) to convert a major portion of the aluminum in said scrap to an aluminum chloride fume, and



(ii) to form a molten zinc-copper-aluminum alloy product containing a minor proportion of the copper values of the cuprous chloride reactant; and

(e) separating the alloy product from the aluminum chloride fume.

4,612,169

PROCESS FOR STERILIZATION OF ENZYME CONTAMINATED BY BACTERIA

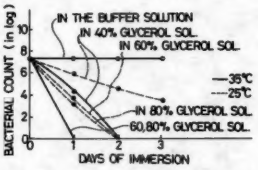
Taisuke Iwasaki, Hachioji; Yoshihiko Honda, Sakato; Fumio Nagaoka; Sadao Aoki, both of Atsugi; Kazuo Horigome, Sagamihara, and Ruyzo Imada, Ebina, all of Japan, assignors to Snow Brand Milk Products Co. Ltd., Sapporo, Japan

Filed Mar. 21, 1984, Ser. No. 592,010

Claims priority, application Japan, Mar. 25, 1983, 58-50157

Int. Cl.⁴ A61L *9/00*

U.S. Cl. 422—32 **2 Claims**



1. A process of sterilizing an immobilized enzyme mass contaminated by bacteria, comprising the step of immersing said enzyme mass into a composition consisting of an aqueous solution of at least one polyvalent alcohol having 2 to 3 hydroxyl groups, from the group consisting of glycerol, propylene glycol and ethylene glycol in a concentration of 40–60% by weight for a period of from 3 hours to 5 days.

4,612,170

BLOOD OXYGENATOR WITH DUAL SPARGER AND REUSEABLE HEAT EXCHANGER

Ronald B. Luther, 530 Kings Rd., Newport Beach, Calif. 92663, and Pradip V. Choksi, 10935 Yolanda Ave., Northridge, Calif. 91326

Filed Jun. 13, 1983, Ser. No. 503,614

Int. Cl.⁴ A61M *1/03*

U.S. Cl. 422—46 **18 Claims**

1. A blood oxygenator having a removeable and reuseable heat exchanger, comprising:

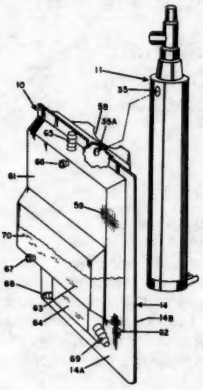
(a) an elongate-shaped container providing an upper opening for insertion of the heat exchanger therein;

(b) an elongate heat exchanger: i. formed as an integral metal

extrusion; ii. defining a circular cross section; iii. providing external spiral fins; iv. including a hollow, coaxially and centrally aligned interior for circulation of heat exchange fluid therein; v. the heat exchanger being closely finned inside the container with the fins contacting the container; vi. the heat exchanger being oriented upwardly for uniform movement of blood between adjacent fins and the container to control blood temperature and oxygenate the blood; vii. the heat exchanger defining a round elongate neck at an upper end for removeable attachment to a heat exchange fluid supply, the heat exchanger being removeably insertable through the upper opening, and sealed into the container by a removeable plug surrounding the elongate neck;

(c) a removeable plug surrounding the elongate neck;

(d) a sparger inlet means for separately supplying O_2 and CO_2+O_2 gas and venous blood to the container at its lower end, the sparger inlet including two separate inlet



means for the O_2 and CO_2+O_2 being positioned in proximity to the venous inlet, the O_2 and CO_2+O_2 sparger inlets having a respective pore size differential sufficient to produce different bubble sizes from the respective spargers to enhance O_2 absorption and CO_2 removal, thereby enabling control of the oxygenator during use by varying the CO_2 and O_2 content of the gas supply; and,

(e) a blood processing unit for defoaming, degassing and collecting oxygenated blood, the elongate container being attached to and integral with the blood processing unit, and being in fluid communication therewith through a port positioned upwardly of the container;

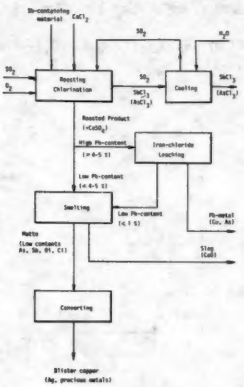
whereby, the heat exchanger is insertable into the upper opening of the elongate shaped container, and sealed therein along the opening by the plug, and upon completion of use, the heat exchanger is constructed and arranged to be disengaged from the heat exchange fluid supply, and unplugged from the container, followed by cleaning, sterilization and reuse.

4,612,171
METHOD FOR RECOVERING METAL VALUES FROM MATERIALS CONTAINING COPPER AND/OR PRECIOUS METALS

Sven A. Holmström, Ursviken, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 27, 1984, Ser. No. 655,051
Claims priority, application Sweden, Oct. 3, 1983, 8305425
Int. Cl.[4] C22B *1/08*; C01G *23/02*
U.S. Cl. 423—22 **9 Claims**

1. A method for refining a material selected from the group consisting of copper-containing materials, precious metal-containing materials and mixtures thereof which also contain at least one of antimony and bismuth in such quantities as to inhibit processing of said material to extract metal values therefrom comprising heating a mixture of the material and a solid or liquid chlorination agent to a temperature of between 450° C. and 750° C., the amount of chlorination agent being slightly greater than the stoichiometric amount of the impurities to be



chlorinated including antimony and/or bismuth whereby vaporized antimony and/or bismuth chloride is formed while maintaining the copper and/or precious metal values of the material in a substantially unaffected form and separating the vaporized antimony and/or bismuth chloride from the material.

4,612,172
PURIFICATION OF MOLYBDENUM

Timothy A. Brunelli, and Michael J. Cheresnowsky, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 22, 1985, Ser. No. 704,685
Int. Cl.[4] C01G *39/00*
U.S. Cl. 423—56 **4 Claims**

1. A process for removing potassium from relatively impure molybdenum trioxide and forming a molybdenum compound of high purity, said process comprising:

(a) contacting said impure molybdenum trioxide with an acid leach which consists essentially of a mineral acid and the ammonium salt of said mineral acid in a weight ratio of about 4.3 to 1 to about 4.8 to 1 of said acid leach to said impure molybdenum trioxide at a sufficient temperature and for a sufficient time to solubilize the major portion of the potassium and form a leached molybdenum trioxide;

(b) separating said leached molybdenum trioxide from the resulting potassium containing acid leach;

(c) washing said leached molybdenum trioxide with sufficient water to remove any residual impurities:

(d) separating the resulting washed molybdenum trioxide from the resulting wash water;

(e) dissolving the resulting washed molybdenum trioxide in ammonium hydroxide having a sufficient ammonia concentration to form an ammonium molybdate solution; and

(f) crystallizing the highly pure molybdenum compound from said ammonium molybdate solution.

4,612,173
METHOD OF PURIFYING BY-PRODUCT GYPSUM

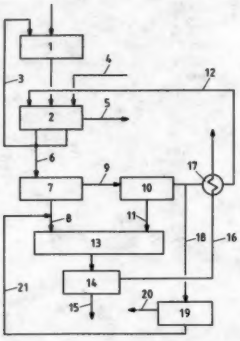
Hans-Werner Gosch; Karl Franke, both of Essen; Jörg Kohlbecker, Rheinberg, and Bahram Dormichian, Essen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,990

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307315

Int. Cl.[4] C01F *11/46, 11/08;* **C04B** *11/00;* **B01D** *21/01*

U.S. Cl. 423—170 **6 Claims**



1. A method of purifying by-product gypsum obtained in the production of phosphoric or hydrofluoric acids and including water-soluble impurities, comprising the steps of mixing in a sludge forming stage the by-product gypsum with water to form a paste-like sludge; feeding the sludge into a multi-stage filtering washer having an inlet for washing, an outlet for discharging purified gypsum, and outlets for discharging filtrate portions from respective filtering and washing stages; feeding a first filtrate portion from the first filtering and washing stage into a filtrate preparing unit where a major part of the impurites is precipitated and simultaneously returning a second filtrate portion from another filtering and washing stage into said sludge-forming stage; said filtrate preparation unit having two consecutive neutralization stages where said first filtrate portions is neutralized to pH 2.5–4.5 separated from precipitates, then neutralized to pH 9–13, again separated from precipitatates and then split into two partial streams; recycling one of said partial streams into said washing water inlet of the washer and feeding the other partial stream into an evaporation stage where it is decomposed into a distillate and a brine; discharging the precipitates separated in said first and second neutralization stage to a mechanical draining stage and to a subsequent drying stage; admixing said brine from the evaporation stage to said separated sludges during their discharge from said neutralization stages and prior to the draining and drying stages; and utilizing said distillate as fresh water or a cooling water or as a boiler water.

4,612,174
METHOD OF REMOVING NOXIOUS SUBSTANCES FROM GASES

Werner Fabian; Helmut Roehle, and Peter Wolfram, all of Berlin, Fed. Rep. of Germany, assignors to Heinrich-Hertz-Institute für Nachrichtentechnik Berlin GmbH, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,478

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342816

Int. Cl.[4] B01D *53/00*

U.S. Cl. 423—210 **4 Claims**

1. A method of removing noxious components from substances including waste gases, where the noxious components contain at least one of phosphine, arsine and trimethylphosphane; which removal comprising: oxidizing the phosphine, arsine and trimethyl phosphane at room temperature in a first stage and a spontaneous reaction by means of one of:

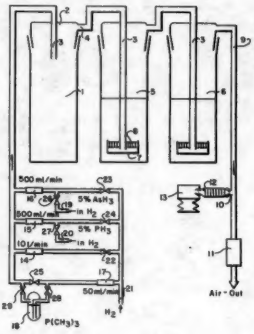
a solution of bromic acid,

a solution of iodic acid,

a solution of bromate salt,

a solution of iodate salt,

an aqueous solution of bromine,



an aqueous solution of iodine,

an organic solution of bromine, and

an organic solution of iodine,

so that they are absorbed by complete conversion into water-soluble acids and in which a bromine or iodine is formed as a free halogen, and in a second stage, converting and dissolving in basic solution, the bromine or iodine which is formed in a first stage into a corresponding bromide or iodide or bromate or iodate.

4,612,175
FLUE GAS DESULFURIZATION/DENITRIFICATION USING METAL-CHELATE ADDITIVES

John B. L. Harkness, Naperville; Richard D. Doctor, Glen Ellyn, and Ronald J. Wingender, Deerfield, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,366

Int. Cl.[4] A47B *43/00, 48/00;* **C01B** *17/00, 21/00*

U.S. Cl. 423—235 **20 Claims**

1. A method for removing SO_2 and NO from flue gas containing oxygen resulting from the combustion of carbonaceous material comprising:

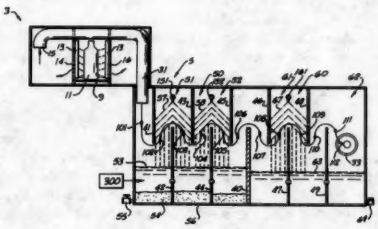
preparing an aqueous scrubber solution containing an aqueous sulfur dioxide sorbent and an active metal chelate, the active metal chelate being prepared by mixing a metal ion as a soluble metal salt in an aqueous solution with a chelating agent in an oxygen-free environment for a period of time sufficient for all the possible coordination sites on the chelating agent to coordinate with the metal ion, thereby forming the active metal chelate, and

contacting the oxygen-containing flue gas containing at least 1000 ppm SO_2 with the scrubber solution while maintaining the pH of the scrubber solution between 5 and 9, the SO_2 dissolving in the solution to form HSO_3^-, the NO dissolving in the solution to form HNO_2, the HNO_2 reacting with some of the HSO_3^- to form hydroxylamine N-sulfonates, thereby removing SO_2 and NO from the flue gas.

4,612,176
PROCESS FOR TREATING METAL HALIDES AND ORGANO SUBSTITUTED METAL HALIDES WITH METAL RECOVERY

Carroll E. Stone, 2250 Roanoke Rd., San Marino, Calif. 91108

Continuation-in-part of Ser. No. 493,362, May 10, 1983, Pat. No. 4,511,545. This application May 9, 1984, Ser. No. 608,486
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] B01D *53/34;* **C03C** *15/00*
U.S. Cl. 423—240 **73 Claims**



1. A process for recovering metal from a gas containing a metal halide, said process comprising the steps of
passing the gas to a hot spray compartment;
spraying the gas with a hot water spray to form a hot water treated gas, a metal precipitate and a hydrogen halide;
collecting the metal precipitate and the hot water spray in a hot water collection device;
separating the metal precipitate from the hot water spray; and
passing the hot water treated gas together with substantially all of the hydrogen halide in the gaseous phase out of the hot spray compartment.

4,612,177
REMOVAL OF SULFUR OXIDES AND PARTICULATES WITH COPPER-CONTAINING ABSORBERS

Richard A. Kretchmer, Clarendon Hills, Ill., and Lansing M. Hinrichs, Louisville, Ky., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 13, 1984, Ser. No. 640,673
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] B01J *8/00;* **C01L** *17/00;* **C01B** *21/00;* **C10G** *11/02*
U.S. Cl. 423—244 **13 Claims**

1. A gas purification process, comprising the steps of:
cracking a hydrocarbon feedstock in a reactor of a catalytic cracking unit in the presence of a cracking catalyst under catalytic cracking conditions to produce an upgraded cracked product leaving spent cracking catalyst;
regenerating said spent cracking catalyst in a regenerator;
emitting regenerator particulate-laden off-gases comprising sulfur oxides and cracking catalyst particulates from said regenerator;
passing said regenerator particulate-laden off-gases generally downwardly through a substantially vertical conduit of a granular bed filter and scrubber, and thereafter, through at least a portion of a downwardly moving bed of sulfur oxide-capturing and particulate-removing copper-containing material comprising at least one member selected from the group consisting of elemental copper, copper compounds, and combinations thereof, at a temperature less than 1,544° F. to remove a substantial portion of said particulates and a substantial portion of said sulfur oxides from said regenerator particulate-laden off-gases so as to produce substantially purified gases having a substantially lower concentration of sulfur oxides and particulates than said regenerator particulate-laden off-gases and leaving spent sulfur oxide-capturing and particulate-removing material with said particulates and sulfur-containing deposits thereon selected from the group consisting essentially of sulfur oxides, sulfates, and combinations thereof;
removing said spent sulfur oxide-capturing and particulate-removing mateial from said granular bed filter and scrubber and feeding said removed material to a regenerator comprising a generally upright lift pipe riser having an overhead collection vessel;
thermally regenerating said spent sulfur oxide-capturing and particulate-removing material in said lift pipe riser at a temperature greater than 1,562° F. while simultaneously moving said spent sulfur oxide-capturing and particulate-removing material substantially upwardly in said lift pipe riser to substantially remove said particulates and said sulfur-containing deposits from said spent material while emitting effluent gases containing said removed particulates and sulfur oxides;
feeding said regenerated sulfur oxide-capturing and particulate-removing material to said granular bed filter and scrubber for use as part of said downwardly moving bed;
removing a substantial portion of said particulates from said effluent gases from said lift pipe riser in at least one cyclone;
recovering elemental sulfur from said effluent gases in a sulfur recovery unit; and
said sulfur oxide-capturing and particulate-removing copper-containing material comprising a support selected from the group consisting essentially of alumina, silica, kaolin, diatomaceous earth, boria, mullite, and combinations thereof.

4,612,178
DEGRADATION OF POLYCYCLIC AROMATIC HYDROCARBONS ADSORBED OVER CHRYSOTILE ASBESTOS

Jean-Marc Lalancette, and Hugues Menard, both of Sherbrooke, Canada, assignors to Ceram-Sna Inc., Quebec, Canada

Filed Oct. 30, 1985, Ser. No. 792,921
Int. Cl.[4] C01B *33/12;* **B01J** *23/90, 20/10*
U.S. Cl. 423—338 **4 Claims**

1. A process for degrading polycyclic aromatic hydrocarbons adsorbed over chrysotile asbestos fibers which comprises oxidizing at low temperature in the presence of moisture with ozone a mass of polycyclic aromatic hydrocarbons adsorbed on chrysotile asbestos fibers, while the hydrocarbons are degraded mainly to carbon dioxide and the resulting chrysotile asbestos is recovered.

4,612,179
PROCESS FOR PURIFICATION OF SOLID SILICON

Angel Sanjurjo, San Jose, and Sylvia Pressacco, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 13, 1985, Ser. No. 711,584
Int. Cl.[4] C01B *33/02*
U.S. Cl. 423—348 **25 Claims**

1. A process for purifying silicon comprising:
heating solid silicon to a temperature below the melting point of silicon;
contacting said heated solid silicon with a purifying agent which is substantially nonreactive with silicon; and
causing the impurities in the silicon to enter the purifying material.

4,612,180

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim, Towanda; Robert P. McClintic, Monroeton, and Clarence D. Vanderpool, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,841
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] C01G 41/00
U.S. Cl. 423—593 6 Claims

1. A method for producing crystalline ammonium metatungstate from ammonium paratungstate, said method comprising:
(a) heating said ammonium paratungstate with microwave radiation to form a heated ammonium paratungstate,
(b) forming a slurry of said heated ammonium paratungstate in water,
(c) heating said slurry at from about 80° C. to about 100° C. at relatively constant volume until the pH of said slurry becomes stabilized at from about 5.8 to about 6.0,
(d) adjusting the pH of said stabilized slurry to from about 4.2 to about 3.0,
(e) digesting the resulting pH adjusted slurry at from about 80° C. to about 100° C. for from about 2 hours to about 6 hours to form a solution of ammonium metatungstate and some insoluble material,
(f) evaporating said solution to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution,
(g) separating said insoluble material from said concentrated ammonium metatungstate solution, and
(h) crystallizing ammonium metatungstate from said concentrated ammonium metatungstate solution.

4,612,181

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Carl W. Boyer, Wyalusing, and Donald H. Ennis, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,842
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] C01G 41/00
U.S. Cl. 423—593 3 Claims

1. A method of producing crystalline ammonium metatungstate from ammonium paratungstate, said method comprising:
(a) heating said ammonium paratungstate in a multiple hearth furnace at from 200° C. to about 400° C. to form a relatively uniformly heated ammonium paratungstate;
(b) digesting said heated ammonium paratungstate in water to form an aqueous ammonium metatungstate solution, the digestion being carried out by adding said heated ammonium paratungstate to the water in separate portions, the addition of each portion being followed by heating the respective resulting mixture at from about 80° C. to about 100° C. for from about 5 hours to about 13 hours at relatively constant volume while maintaining the pH of the respective resulting mixture at from about 3.5 to about 4.5 by the addition of ammonia as necessary, the addition of said separate portions of heated ammonium paratungstate being carried out until the concentration of said aqueous ammonium metatungstate solution reaches about 260 grams of WO_3 per liter;
(c) evaporating said aqueous ammonium metatungstate solution to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution;
(d) separating any insoluble material from said concentrated ammonium metatungstate solution; and
(e) crystallizing ammonium metatungstate from said concentrated ammonium metatungstate solution.

4,612,182

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim; Martin B. MacInnis, both of Towanda, and Robert P. McClintic, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,843
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[4] C01G 41/00
U.S. Cl. 423—593 4 Claims

1. A method of producing crystalline ammonium metatungstate from paratungstate, said method comprising:
(a) heating said ammonium paratungstate at from about 100° C. to about 230° C. for from about 1 hour to about 8 hours to remove some ammonia and some water and form a heated ammonium paratungstate;
(b) forming a slurry of said heated ammonium paratungstate and water;
(c) digesting said slurry at from about 80° C. to about 100° C. for from about 2 hours to about 6 hours at relatively constant volume while maintaining the pH of said slurry at from about 4.2 to about 3.0 by the addition of ammonia as necessary to form a solution of ammonium metatungstate in water and some insoluble material;
(d) evaporating said solution to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution;
(e) separating any insoluble material from said concentrated ammonium metatungstate solution; and
(f) crystallizing ammonium metatungstate from said concentrated ammonium metatungstate solution.

4,612,183

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim, Towanda; Carl W. Boyer, Wyalusing; Martin B. MacInnis, and Donald H. Ennis, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,992
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[4] C01G 41/00
U.S. Cl. 423—593 3 Claims

1. A method of producing crystalline ammonium metatungstate from ammonium paratungstate, said method comprising:
(a) heating said ammonium paratungstate in a multiple hearth furnace at from about 200° C. to about 400° C. to form a relatively uniformly heated ammonium paratungstate;
(b) forming a slurry of said heated ammonium paratungstate and water;
(c) digesting said slurry at from about 70° C. to about 100° C. for less than about 6 hours at relatively constant volume while maintaining the pH of said slurry at from about 4.2 to about 3.0 by the addition of ammonia as necessary to form a solution of ammonium metatungstate in water,
(d) evaporating said solution to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution;
(e) separating any insoluble material from said concentrated ammonium metatungstate solution; and
(f) crystallizing ammonium metatungstate from said concentrated ammonium metatungstate solution.

4,612,184

HIGH SPECIFIC SURFACE HYDRARGILLITE

Laurent Seigneurin, Salindres, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 4, 1985, Ser. No. 707,572
Claims priority, application France, Mar. 2, 1984, 84 03274
Int. Cl.[4] C01F 7/02
U.S. Cl. 423—626 11 Claims

1. A process for the preparation of high specific surface hydrargillite, comprising (i) reacting an alkali metal aluminate with hydrofluoric acid at a temperature ranging from about 5° to 95° C., the amount of said hydrofluoric acid ranging from about 25% to 90% of that amount stoichiometrically required for complete neutralization of the alkalinity of said aluminate, (ii) treating the hydrargillite precipitate which results at a temperature of from about 5° to 95° C. for up to about 10 hours, and thence (iii) recovering said hydrargillite precipitate.

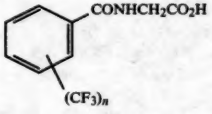
4,612,185

METHODS AND COMPOSITIONS FOR ENHANCING MAGNETIC RESONANCE IMAGING

Richard T. Dean, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

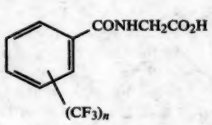
Filed Oct. 15, 1984, Ser. No. 660,642
Int. Cl.[4] G01N 1/00
U.S. Cl. 424—2 10 Claims

1. A composition for enhancing fluorine-19 magnetic resonance images of body organs and tissues, the composition comprising a water soluble, substantially nontoxic salt of a compound of the formula:



wherein n=1 to 5.

5. A method for enhancing fluorine-19 magnetic resonance images of body organs and tissues which comprises administering to a mammal a composition comprising a water soluble, substantially nontoxic salt of a compound of the formula:



wherein n=1 to 5, in a sufficient amount to provide enhancement of magnetic resonance images of said body organs and tissues.

4,612,186

METHOD FOR ESTABLISHING BLOOD LEVELS OF BIOCIDE IN ANIMALS

James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 590,778, Mar. 19, 1984. This application Sep. 27, 1985, Ser. No. 780,863
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.[4] A61K 9/00, 9/20
U.S. Cl. 424—15 15 Claims

1. A method for producing an avermectin blood level of 2 ng/ml in an animal for the management of infestation, which method comprises:

(a) admitting into the animal a dispenser, the dispenser comprising:

(1) a wall that surrounds and defines an internal lumen;

(2) means in the lumen comprising from 10 ng to 40 g of avermectin, said means comprising a heat responsive composition that absorbs heat form the animal and thereby forms a dispensable composition comprising avermectin;

(3) means in the lumen for occupying more space in the lumen and for exerting pressure against the means comprising avermectin for urging avermectin from the dispenser;

(4) exit means in the dispenser communicating with the lumen for delivering avermectin from the dispenser; and,

(b) administering the avermectin by the means absorbing heat and forming a dispensable composition and by the means for occupying space, occupying more space and exerting pressure against the dispensable composition, whereby avermectin is delivered through the exit means in a beneficially effective amount to the animal for producing the avermectin blood level over time.

4,612,187

ORYZANOL-CONTAINING SOFT CAPSULE

Takeo Iijima, Koushoku, and Hiroyuki Sano, Ueda, both of Japan, assignors to Nisshin Chemicals Co., Ltd., Japan

Continuation of Ser. No. 488,790, Apr. 26, 1983, abandoned. This application Nov. 6, 1984, Ser. No. 668,663
Int. Cl.[4] A61K 9/48
U.S. Cl. 424—16 1 Claim

1. A soft gelatin capsule which contains a composition encapsulated within said capsule consisting essentially of (a) γ-oryzanol alone or γ-oryzanol in combination with riboflavin butyrate, (b) at least one surface active agent selected from the group consisting of sorbitan monolaureate, sorbitan sesquioleate, and sorbitan monooleate, and (c) at least one oil selected from the group consisting of tocopherol and derivatives thereof, wheat germ oil, safflower oil, soybean oil, neutral oil, cottonseed oil, rapeseed oil, corn oil and peanut oil wherein the γ-oryzanol is the oryzayl alcohol ester of ferulic acid in which the oryzayl alcohol moiety is composed of 25 to 50% of campesterol, 15 to 25.73% of β-sitosterol, 15 to 30% of cycloartenol, and 10 to 40% of 2,4-methylenecycloartanol.

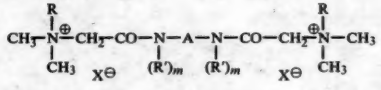
4,612,188

COSMETIC COMPOSITIONS WHICH CONTAIN BIS-(QUATERNARY AMMONIUM) DERIVATIVES WITH TWO LIPOPHILIC CHAINS AND CERTAIN SAID DERIVATIVES

Vahan Zorayan, Enghien les Bains, and Claire Fiquet, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Sep. 16, 1980, Ser. No. 187,954
Claims priority, application Luxembourg, Sep. 17, 1979, 81694
Int. Cl.[4] A61K 7/06, 7/09, 7/11, 7/13
U.S. Cl. 424—47 27 Claims

1. A composition for the treatment of hair to improve the combing-out, the softness and the glossiness properties of hair, and of skin to impart softness to the touch properties thereto, said composition containing in a cosmetically acceptable medium at least one bis-(quaternary ammonium) derivative having two lipophilic chains and having the formula



wherein

R represents a saturated or unsaturated, linear or branched

aliphatic group having from 8 to 22 carbon atoms or a fatty chain derived from tallow, lanolin or copra,

A represents $-(CH_2)_n-$ wherein n represents an integer ranging from 1 to 18, in which case R' represents hydrogen and m=1, or

A, together with the nitrogen atoms to which it is attached, represents a heterocyclic group, in which case m=0, and

X^- represent an anion derived from a mineral or organic acid,

said bis-(quaternary ammonium) derivative being present in an amount of 0.01 to 10 percent by weight of said composition and an effective amount of a sun filter agent.

4,612,189

DENTIFRICE COMPOSITION

Masaaki Oyobe, Kanagawa; Hiromichi Ichikawa, Tokyo, and Tsutomu Maeyama, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 179,795, Aug. 20, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 372,005

Claims priority, application Japan, Aug. 31, 1979, 54-111409

Int. Cl.[4] A61K *7/16*

U.S. Cl. 424—49 2 Claims

1. A dentifrice composition having a transparent appearance, comprising:

(a) an abrasive amorphous hydrated precipitated silica, having an SiO_2 content of at least 90% by weight, an alkali and alkaline earth metal oxide content of 0–5% by weight and an inter-bonded metal oxide content of less than 1% by weight, and having an average particle size of 0.5–30 microns, a specific surface area measured by the BET method of not more than 500 m^2/g, a refractive index of 1.44–1.47 and a liquid absorption of 0.8–1.3 c.c./g;

(b) an amorphous precipitated silicate, containing at least 70% by weight of SiO_2 which is partially inter-bonded with 1 to 5% by weight of alumina, and having an average particle size of 0.5–30 microns, a specific surface area measured by the BET method of not more than 500 m^2/g, a refractive index of 1.445–1.47 and a liquid absorption of 0.6–1.2 c.c./g; and

(c) a transparent vehicle having substantially the same refractive index as that of the silica, the ratio of the silica to the silicate being in the range of 4:6 to 6:4 on a weight basis, the content of the mixture of the silica and the silicate being in the range of 5 to 15% by weight of the composition, and the pH of the composition being in the range of 4.5 to 10.

4,612,190

GROWTH INHIBITOR FOR CARIOGENIC BACTERIA

Toshiya Sato; Kenichi Asano, and Yuzo Yamaguchi, all of Kanagawa, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,838

Claims priority, application Japan, Nov. 15, 1983, 58-213336

Int. Cl.[4] A61K *7/16, 31/075*

U.S. Cl. 424—49 13 Claims

1. A process for inhibiting the growth of cariogenic bacteria locally in the mouth which comprises administering locally to the mouth an amount of dihydroguaiaretic acid effective to inhibit growth of *Streptococcus mutans,* admixed with an acceptable carrier.

4,612,191

STAIN REMOVAL TOOTHPASTE

Kuo-Chen Yeh, Westfield, and Joseph Synodis, New Providence, both of N.J., assignors to Block Drug Co., Inc., Jersey City, N.J.

Filed Aug. 23, 1984, Ser. No. 643,405

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 14 Claims

1. A dentifrice having high polishing and cleaning properties suitable for removal of coffee and tea stains comprising about 10–35% of an abrasive system in combination with a non-toxic paste, said abrasive system comprising a combination of about 5–15% anhydrous aluminum silicate and about 5–20% diatomaceous silica in a ratio of about 0.5:1 to about 1.5:1, said dentifrice having a radioactive dentin abrasion index not in excess of about 150.

4,612,192

OIL COMPONENTS FOR COSMETICS AND PHARMACEUTICALS

Ingeborg Scheuffgen, Neuss, and Alfred Meffert, Monheim, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,060

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326455

Int. Cl.[4] A61K *7/027, 7/06, 7/021;* C11C *3/00*

U.S. Cl. 424—70 8 Claims

1. In a method for treating the human skin, mucous membrane, or hair by applying thereto a cosmetic or dermatological preparation which contains an oil component, the improvement wherein the oil component is at least one reaction product of an epoxidized triglyceride oil and a C_{1-4} monohydric alcohol.

6. In a cosmetic preparation in stick form containing at least one wax component wherein said at least one wax component is one or more of beeswax, carnauba wax, and candelilla wax, and at least one cosmetic oil, the improvement wherein the cosmetic oil comprises from about 5 to about 60% by weight of at least one reaction product of an epoxidized triglyceride oil and a C_{1-4} monohydric alcohol.

4,612,193

STY OINTMENT AND METHOD OF USING THE SAME

Harry W. Gordon, Wantagh, and Kenneth Chung, Greenlawn, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 564,716, Dec. 23, 1983, abandoned. This application May 20, 1985, Ser. No. 735,966

Int. Cl.[4] A61K *31/305, 33/22, 33/28*

U.S. Cl. 424—146 7 Claims

1. In an ointment composition for the treatment of styes, comprising an emollient ointment base and about 1–1.2% yellow mercuric oxide by weight of the composition, wherein the improvement comprises increasing the color stability and enhancing the therapeutic efficacy of the composition by the addition of: about 2–10% wheat germ oil by weight of the composition to enhance the antimicrobial activity of the yellow mercuric oxide and about 2–10% boric acid by weight of the composition to stabilize the yellow mercuric oxide in the presence of the wheat germ oil and to retard discoloration of the yellow mercuric oxide while helping to sustain its antibacterial activity for long periods of time so as to obtain an effective life for the composition in excess of two years.

4,612,194

ANTI-RHEUMATIC AGENTS AND THEIR USE

Roshdy Ismail, Siebengebirgs-Apotheke, Siebengebirgsallee 2, 5000 Köln 41, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,462

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405240; Feb. 27, 1984, 3407024; Mar. 7, 1984, 3408260; Apr. 24, 1984, 3415250; May 2, 1984, 3416162; Aug. 7, 1984, 3429019; Sep. 7, 1984, 3432881; Sep. 7, 1984, 3432882

Int. Cl.[4] A61K *31/05, 31/35, 31/41, 31/44, 31/52, 31/135, 31/355, 31/435, 31/495, 31/505, 35/78*

U.S. Cl. 424—195.1 6 Claims

1. A method for treating rheumatic diseases in a patient suffering therefrom comprising administering to said patient vitamin E in an amount therapeutically effective to treat said rheumatic diseases in combination with a functionally effective

amount of at least one of nicotinic acid or derivatives, Buflomedil, Flunarizine, Cinnarizine, Bencyclan hydrogenfumarate, Vincamine, dihydroergotoxine methanesulphonate, Pentoxifylline, beta-pyridylcarbinol, Bamethan sulfate, Gingko flavoglycosides, Extract. Hippocastani, and beta-hydroxyethylrutoside.

4,612,195

PROCESS FOR SWEETENING CHEWING GUM WITH AN L-ASPARTIC ACID SWEETENING DERIVATIVE AND PRODUCTS OF IMPROVED SWEETNESS STABILITY OBTAINED THEREBY

Wayne J. Puglia, Bayville, N.Y.; Donna M. Rosa, Stamford, Conn.; Sigismondo A. DeTora, Pearl River, N.Y., and John E. Beam, Norwalk, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 1, 1984, Ser. No. 606,088
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 **21 Claims**

1. A process for sweetening chewing gum with an L-aspartic acid derivative comprising applying onto at least a portion of the surface of the chewing gum a suspensin of the L-aspartic acid sweetening derivative in a substantially water-free liquid vehicle comprising at least-about 23% by weight of ethyl acetate, the amount of the L-aspartic acid sweetening derivative being from about 1% to about 25% by weight of the liquid vehicle.

4,612,196

PREPARATION OF LOW ALCOHOL BEVERAGES BY REVERSE OSMOSIS

Henry Goldstein, Brookfield; Charles L. Cronan, Shorewood, and Etzer Chicoye, Wauwatosa, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Aug. 23, 1984, Ser. No. 644,500
Int. Cl.[4] C12C *11/00;* C12G *1/00, 3/00*
U.S. Cl. 426—14 **7 Claims**

1. A method of reducing the alcohol content of a fermented alcoholic beverage to produce an alcoholic beverage concentrate having less alcohol content but the flavor and aroma of a fermented alcoholic beverage prior to reducing the alcohol content, said method comprising subjecting a fermented alcoholic beverage to reverse osmosis employing a thin film composite membrane having a support layer of polysulfone, a barrier layer of a polymer prepared from a polyamine and a polyacyl and a fiber backing, which membrane has a molecular weight cut-off of less than about 100 for organics and rejects the volatile components which contribute to flavor and aroma and permits about 25 to about 30% of the alcohol in the beverage to pass through and then collecting the concentrate.

4,612,197

SAUCE ENHANCER IN TUBES

Hermann Postner, Ludwigsburg, Fed. Rep. of Germany, assignor to Nestec S. A., Vevey, Switzerland

Filed Jun. 17, 1985, Ser. No. 745,598
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423699
Int. Cl.[4] A23L *1/32, 1/39*
U.S. Cl. 426—47 **17 Claims**

1. A sauce enhancer comprising cream, egg yolk modified by phospholipase A2, and a liquid butter fat fraction having a melting point less than 13° C. wherein the sauce enhancer has a pH-value of from 5.6 to 5.8 and a water activity value (a_w-value) as measured at 25° C. of from 0.84–0.9.

4,612,198

HIGH STABILITY, HIGH FLAVOR, BREAKFAST PASTRY AND METHOD FOR PREPARING THE SAME

Glenn Wallin, Minneapolis; Diane Rosenwald, Brooklyn Park; James Citti, and Samuel Yong, both of Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 5, 1982, Ser. No. 355,271
Int. Cl.[4] A21D *13/08*
U.S. Cl. 426—94 **38 Claims**

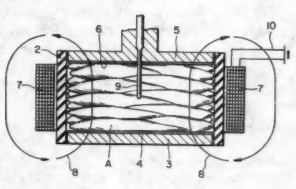
1. A high moisture, shelf stable and product stable filling, especially for toaster breakfast pastries, comprising:
- a flavored pastry filling material having a viscosity of from about 20,000 cps to about 50,000 cps,
- a starch content from about 3.5% by weight to about 8% by weight,
- a gum content from about 0.15% by weight to about 0.4% by weight,
- a pH from about 2.8 to about 7.5; and
- a total moisture content from about 30% to about 50% by weight.

4,612,199

METHOD OF AND APPARATUS FOR PRODUCING PROCESSED FOODSTUFFS BY PASSING AN ELECTRIC CURRENT

Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,444
Claims priority, application Japan, Apr. 3, 1984, 59-66385
Int. Cl.[4] A23L *3/00, 3/32;* A61L *2/04*
U.S. Cl. 426—237 **2 Claims**



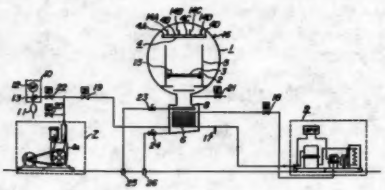
1. A method of producing processed foodstuffs by passing an electric current to foodstuff materials, comprising the steps of:
- uniformly permeating a foodstuff material with a salt solution;
- placing the salt solution permeated foodstuff material in a container of insulating material having an annular coil arranged around it, said salt solution permeated foodstuff material being interposed between a pair of electrode members; and
- passing electric currents simultaneously through the annular coil and between the pair of electrode members, whereby the foodstuff material processed by the electric current passed thereto is thermally treated and sterilized at a substantially uniform temperature by lines of magnetic force and Joule heat generated by the electric currents.

4,612,200

METHOD FOR PRODUCING REFRESHABLE DRY FOOD

Masami Sato, 29-3-401, Minamidai 2-Chome, Nakano-Ku, Tokyo, Japan, assignor to Stephano & Co., Ltd. and Masami Sato, both of Yokohama, Japan

Continuation-in-part of Ser. No. 570,848, Jan. 16, 1984, abandoned. This application Aug. 27, 1985, Ser. No. 769,721
Claims priority, application Japan, Nov. 4, 1983, 58-205897
Int. Cl.[4] A23B *4/06*; F26B *5/06*
U.S. Cl. 426—242 8 Claims



1. A method of producing refreshable dry food comprising the steps of

placing unfrozen raw food in a vacuum chamber;

reducing the pressure in said chamber to a value within the range 5 Torr to 1 Torr, thereby reducing the temperature to a value within the range of 0° C. to −10° C.;

irradiating the food with infrared energy having a wavelength of at least 5 microns; and

terminating said irradiation when said food reaches a temperature in the range +5° C. to +40° C. whereby said food is dried before its texture is adversely affected.

4,612,201

METHOD OF HEATING KNEADED MARINE PASTE PRODUCTS

Tutomu Maruyama, Matsudo; Norikazu Nakagawa, Funabashi; Tsuyoshi Hosokawa, Tokyo; Yuji Sakayori, Kawasaki; Shigeru Tanaka, and Yoshiya Oomatsu, both of Okayama, all of Japan, assignors to Kabushiki Kaisha Kibun, Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,216
Int. Cl.[4] A23L *1/325*
U.S. Cl. 426—511 6 Claims

1. A method of heating a kneaded marine paste product in a heating chamber to coagulate the proteins of said paste product, which comprises carrying out heating under the conditions of:

(A) blowing superheated steam as the heating source into the heating chamber;

(B) preventing the paste product from being contacted directly by the superheated steam being blown in its initial blown direction into the chamber; and

(c) controlling the temperature in said chamber in the vicinity of the paste product at less than 100° C.

4,612,202

METHOD FOR MAKING A LOW CALORIE DIPEPTIDE SWEETENING COMPOSITION OF ALKALINE PH

Robert Engel, New City; Adolph P. Gobel, IV, White Plains, both of N.Y.; John E. Hammond, Glen Rock, and Alfred C. Glatz, Summit, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,781
Int. Cl.[4] A23L *1/236*, *1/10*
U.S. Cl. 426—548 8 Claims

1. A method for producing a readily soluble sweetening composition comprising the steps of forming an aqueous dispersion of an edible bulking agent and a dipeptide sweetening compound adjusting the pH of said dispersion with an alkaline agent to between about 9.0 and about 10.0, and drying said solution wherein said bulking agent is hydrolyzed starch materials.

4,612,203

ACIDIFIED MEAT ANALOG PRODUCTS

Vincent Y. Wong, West Chester; David A. Volker; Lydia A. Jury, both of Cincinnati, and David J. Bruno, Jr., Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1984, Ser. No. 666,706
Int. Cl.[4] A23J *1/14*
U.S. Cl. 426—589 19 Claims

14. A process for reducing the pH equilibration time for a shelf-stable sauce product containing textured vegetable protein comprising hydration of the textured protein material with an edible acid in water to provide a pH of from about 3.8 to about 5.18, adding a proteinaceous binder to the acidified textured protein material to effect agglomeration, and heatsetting the mixture of said proteinaceous binder and acidified textured protein material in edible oil to form a meat analog with a structure simulating loose, cooked ground meat and combining said heatset mixture of textured protein material and binder with a sauce.

4,612,204

INCORPORATION OF A CLOUDING AGENT INTO A DRY BEVERAGE MIX

Connie K. A. Huffman, Port Hope, Canada, assignor to General Foods Inc., Don Mills, Canada

Filed Mar. 15, 1985, Ser. No. 712,591
Int. Cl.[4] A23L *2/38*
U.S. Cl. 426—590 16 Claims

1. In a process for incorporating titanium dioxide into a dry beverage mix whose ingredients comprise a sweetener, food acid, flavor and color to provide a uniformly dispersed product wherein the titanium dioxide will provide a permanent cloud in the reconstituted beverage obtained from the total dry beverage mix, the improvement comprising intimately dry mixing finely divided titanium dioxide with the ingredients used in said beverage mix in the presence of a finely divided hydrocolloid gum until a substantially uniformly dispersed product is obtained.

4,612,205

CARBONATED JUICE BEVERAGE WITH COLA TASTE

Philip L. Kupper, and Marsha W. Shields, both of Cincinnati, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 4, 1985, Ser. No. 720,439
Int. Cl.[4] A23L *2/02*
U.S. Cl. 426—599 23 Claims

1. A storage-stable carbonated beverage comprising from about 80% to about 99.9% by weight water, from about 0.2% to about 20% by weight fruit, citrus, or berry juice, and minor amounts of acid and flavorings, excluding cola flavoring and kola nut extract, said beverage having the taste of a cola; wherein said juice comprises from about 50% to about 100% plum juice, 0% to about 20% of one or more fruit, citrus or berry juices imparting tartness, and 0% to about 30% of one or more fruit, citrus or berry juices light in color.

4,612,206

METHOD OF CONTROLLING DEPOSITION AMOUNT DISTRIBUTION IN A VACUUM DEPOSITION PLATING

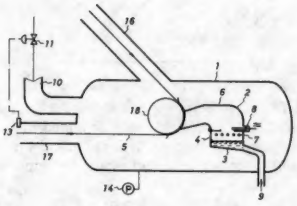
Yoshio Shimozato; Tetsuyoshi Wada; Kenichi Yanagi; Mitsuo Kato; Heizaburo Furukawa; Kanji Wake, all of Hiroshima; Arihiko Morita, Sakai; Norio Tsukiji, Sakai; Takuya Aiko, Sakai; Toshiharu Kittaka, Sakai, and Yasuji Nakanishi, Sakai, all of Japan, assignors to Nisshin Steel Company, Ltd. and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 3, 1985, Ser. No. 740,553

Claims priority, application Japan, Jun. 4, 1984, 59-113195

Int. Cl.[4] C23C *16/00, 16/06*

U.S. Cl. 427—9 5 Claims



1. A method of controlling the transverse thickness distribution of deposited metal film in a continuous vacuum deposition plating process using an apparatus comprising an evacuable deposition chamber in which an evaporation chamber for evaporating a metal to be deposited is contained and in which a substrate sheet strip is hermetically introduced and let out so that the metal vapor is deposited on the surface of the strip at the outlet of the evaporation chamber, said method comprising preliminarily determining the pressure difference between the evacuable deposition chamber and the evaporation chamber which will provide transversely uniform thickness of deposition, determining the vapor pressure in the evaporation chamber which brings about a coating of a desired thickness, and regulating the pressure deposition chamber so as to maintain preliminarily determined pressure difference.

4,612,207

APPARATUS AND PROCESS FOR THE FABRICATION OF LARGE AREA THIN FILM MULTILAYERS

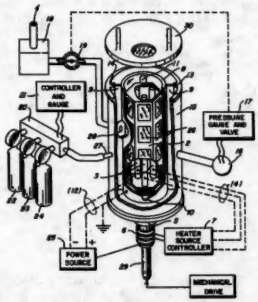
Frank Jansen, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1985, Ser. No. 691,344

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.[4] C23C *13/08*

U.S. Cl. 427—39 26 Claims



1. An apparatus for affecting the preparation of thin film transistor arrays comprised of a chamber means with a gas inlet means, and a gas exhaust means, first rotatable polygon electrode means with a substrate means thereon, and second stationary counterelectrode means of cylindrical shape situated coaxially with the first electrode means.

14. A process for preparing thin film multilayers which comprises providing a vaccum chamber, containing therein a first polygon electrode means with substrates thereon, and a second counterelectrode means; heating the polygon means with heating elements contained therein; causing the polygon electrode means to axially rotate; introducing gases into the chamber means at a crossflow direction with respect to the polygon means; applying electrical power to the first and second electrode means whereby the gases are decomposed enabling deposition thereof on the substrates of the polygon means.

4,612,208

COUPLING AID FOR LASER FUSION OF METAL POWDERS

William J. Reichenecker, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1985, Ser. No. 725,449

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 3 Claims

1. A process for the effective coupling of a laser beam and silver powder on a copper substrate comprising the steps of:

mixing the silver powder with lampblack powder so that the silver powder is coated with lampblack;

depositing the silver powder with lampblack mixed together therewith onto a copper substrate; and

applying laser power to the deposited mixture of silver powder and lampblack powder.

4,612,209

PROCESS FOR THE PREPARATION OF HEAT-CURABLE ADHESIVE FILMS

Imre Forgò, Birsfelden; René Huwyler, Aesch, both of Switzerland, and Jacques Francois, Huningue, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,649

Claims priority, application Switzerland, Dec. 27, 1983, 6927/83

Int. Cl.[4] B05D *3/06, 5/10*

U.S. Cl. 427—54.1 14 Claims

1. A process for the preparation of heat-curable adhesive films of variable tack, which consist essentially of

coating a peelable release film or substrate with a liquid mixture of substances containing

(a) 2–24% by weight of a photopolymerisable compound containing at least one grouping CH_2=C(R)COO— in which R is a hydrogen atom or a methyl group,

(b) 20–90% by weight of a heat-curable epoxide resin or mixture of epoxide resins containing no photopolymerisable groups,

(c) a heat-activatable curing agent for epoxide resins,

(d) 0.1 to 2% by weight of an accelerator,

(e) 0.01 to 5% by weight of a photopolymerisation catalyst for the component (a),

the sum of the components (a) to (e) being 100% by weight,

covering the layer, if appropriate, with a reinforcing material and coating it again with a mixture of substances according to the first step, and

irradiating the layer thus obtained with actinic light.

4,612,210

PROCESS FOR PLANARIZING A SUBSTRATE

Donald C. Hofer, San Martin; Debra B. LaVergne, Palo Alto; Robert J. Twieg, and Willi Volksen, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1985, Ser. No. 759,030
Int. Cl.[4] B05D 5/12, 3/02
U.S. Cl. 427—82 8 Claims

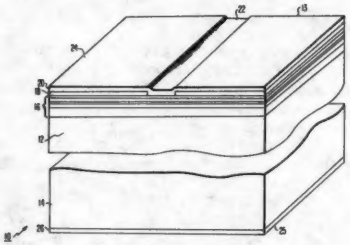
1. A process for covering a substrate with a planarizing coating, said process comprising (1) dissolving in a solvent containing at least 10% of a co-solvent boiling above 220° C., a polyamide alkyl ester formed from a pyromellitic alkyl diester and a para-linked aromatic diamine, (2) coating the substrate with the resulting solution and (3) curing the coating into a planarized layer which fills the gaps in the substrate.

4,612,211

SELECTIVE SEMICONDUCTOR COATING AND PROTECTIVE MASK THEREFOR

Frank Z. Hawrylo, Hamilton Township, Mercer County, and Henry V. Kowger, deceased, late of Jamesburg, both of N.J. (by Dorothy J. Kowger, executrix), assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1983, Ser. No. 563,627
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—86 8 Claims



1. In a method of selectively coating a portion of a body of semiconductor material which method comprises
applying a protective mask to portions of the body;
depositing one or more coating layers onto the exposed areas of the body; and
removing the protective mask from the body;
the improvement comprising employing as said protective mask an alkyl ester of a sulfosuccinate salt having the formula

$$R_1\text{—}OOCH_2C$$
$$R_2\text{—}OOCHC\text{—}SO_3\text{—}X$$

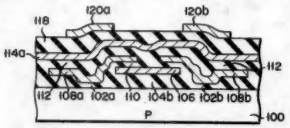
where X is a metal selected from the group consisting of sodium, potassium, calcium and magnesium and wherein R_1 and R_2 are alkyl groups and can be the same or different.

4,612,212

METHOD FOR MANUFACTURING E[2]PROM

Fujio Masuoka, and Hisakazu Iizuka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 320,936, Nov. 13, 1981, Pat. No. 4,531,203.
This application Apr. 9, 1985, Ser. No. 721,431
Claims priority, application Japan, Dec. 20, 1980, 55-180941; Dec. 20, 1980, 55-180952
Int. Cl.[4] H01L 29/27
U.S. Cl. 427—91 5 Claims



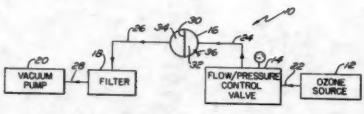
1. A method for manufacturing a semiconductor memory device with a plurality of memory cells arranged in a matrix form, each said plurality of memory cells including a transistor having source and drain regions, said method comprising the steps of:
forming, on a semiconductor region of a first conductivity type, a plurality of field insulating films for separating said memory cells from each other;
selectively forming an erase gate on said field insulating films;
forming a first insulating film on said field insulating films and between said adjacent field insulating films, the portion of said first insulating film formed between said field insulating films serving as a gate insulation film;
selectively forming a floating gate on said gate insulation film, a portion of said floating gate overlapping a part of said erase gate with said first insulating film being interposed between said floating gate and said erase gate;
selectively forming a second insulating film on the portion of said first insulating film formed on said erase gate;
forming a third insulating film on said floating gate and said second insulating film; and
forming a control gate on said third insulating film, said control gate being formed over said erase gate with said first, second and third insulating films being interposed between said control gate and said erase gate, said control gate being insulated from said erase and floating gates and overlapping said portion of said floating gate which overlaps said part of said erase gate.

4,612,213

NICKEL OXIDE BATTERY CATHODE PREPARED BY OZONATION

Hubert G. Meunier, Holden, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1982, Ser. No. 411,171
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—126.6 6 Claims



1. A method for producing a nickel oxide cathode for a high energy density battery consisting of the steps of:
impregnating a porous conducting plaque with a soluble nickel salt such that a conducting plate having nickel hydroxide disposed therethrough is formed;

next, treating said impregnated conducting plate with a strong alkaline solution such that a nickel salt-strong alkaline mixture is formed thereby;

next, ozonating said impregnated conducting plate by passing a stream of gaseous ozone through said plate due to a pressure differential across said plate; and

applying a liquid reagent over said impregnated conducting plate while ozonating to facilitate the action of the ozone on the nickel salt-strong alkaline mixture thereby directly converting said mixture to a tetravalent nickel oxyhydroxide with the stable gamma structure having a valence approaching four.

4,612,214
METHOD FOR COATING SLABS OF NATURAL OR ARTIFICIAL STONE

Michele Salvi, Milan, Italy, assignor to Schering AG, Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 577,599, Feb. 6, 1984, abandoned. This application May 13, 1985, Ser. No. 733,401

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305549

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—136 **15 Claims**

1. A method for coating a water-moist slab of artificial or natural stone with a synthetic resin, which method comprises coating one side of said slab with a curable mixture comprising:

(A) an epoxy resin having on the average more than one epoxy group per molecule; and

(B) a curing agent selected from the group consisting of

(1) adducts of an epoxy resin with an excess of a member selected from the group consisting of aminoamides, aminoimidazolines, and aminoamides containing imidazoline groups, and

(2) phenol-formaldehyde amine condensation products; and

(C) at least one filler and/or reinforcement.

4,612,215
PROCESS AND INSTALLATION FOR THE CONTINUOUS APPLICATION OF AN OXIDIZABLE COATING TO A STRIP

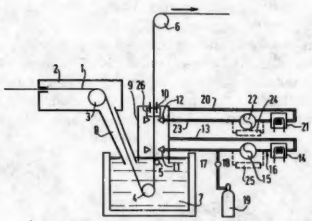
Jean-Paul Hennechart, Mouzon; Bernard Bramaud, Nanterre, and Francois Prat, Mouzon, all of France, assignors to Ziegler S.A., Paris, France

Continuation of Ser. No. 597,050, Apr. 5, 1984, abandoned. This application May 28, 1985, Ser. No. 738,515

Claims priority, application France, Apr. 13, 1983, 83 06056

Int. Cl.[4] B05D *1/12*

U.S. Cl. 427—19 R **18 Claims**



1. A process for the continuous coating of a strip with an oxidizable coating material comprising the steps of: causing the strip to enter and pass through a bath containing the coating material in the liquid state, causing the strip to leave the bath in an ascending direction, equalizing the liquid coating material thickness carried by the strip, said equalizing operation being carried out in an enclosure substantially isolated from an atmosphere external to said enclosure and containing a first non-oxidizing or weakly oxidizing gas, said first gas being at least partially recycled and purified by bringing the gas into contact with a reducing substance to bring its oxygen content below a preselected value, the gas to be purified being reacted with a reducing substance of the hydrocarbon type, introduced in a small quantity, on a hot surface comprising a heated plate or a coated sheet.

4,612,216
METHOD FOR MAKING DUPLEX METAL ALLOY/POLYMER COMPOSITES

Virgil B. Kurfman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 510,029, Jul. 1, 1983, Pat. No. 4,510,208. This application Nov. 26, 1984, Ser. No. 675,037

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—250 **14 Claims**

1. A method of preparing a duplex metal/organic polymer multilayer composite structure, the method comprising:

(a) providing a normally solid, formable thermoplastic polymer layer, said polymer layer having a forming temperature in degrees Kelvin, a first planar surface and a second planar surface, the first and second planar surfaces being generally parallel to each other;

(b) intimately adhering a first normally solid metal layer to at least one planar surface of the polymer layer, the first metal layer having a solidus temperature and a liquidus temperature and being formed from an alloy of two or more metals, said first metal layer having a thickness within the range of from 0.01 micrometers to 0.5 micrometers, the alloy melting at a temperature, or over a range of temperatures, that is within a temperature range of from about 85 to about 150 percent of the forming temperature of the thermoplastic polymer layer, said temperatures being in degrees Kelvin; and

(c) intimately adhering a second normally solid metal layer to the first metal layer, the second metal layer having a solidus temperature and a liquidus temperature and being formed from a metal or an alloy of two or more metals that melts at a temperature, or over a range of temperatures, which is lower than that at which, or over which, melting of the metal alloy of the first metal layer occurs, said temperatures being in degrees Kelvin.

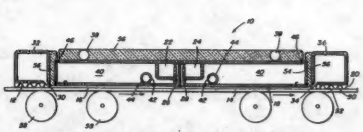
4,612,217
COATING PROCESS FOR MAKING NON-IRIDESCENT GLASS STRUCTURE

Roy G. Gordon, c/o Thompson, Birch, Gauthier & Samuels, 225 Franklin St., Boston, Mass. 02110

Division of Ser. No. 519,248, Aug. 10, 1983, Pat. No. 4,595,634. This application Nov. 15, 1985, Ser. No. 798,467

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—255.1 **11 Claims**



1. A process for manufacturing a glass sheet of the type that has a thin transparent overlayer of electrically conductive oxide thereon, and a thin iridescence-diminishing transparent interlayer over said glass and under said oxide, said process comprising the steps of (a) forming said interlayer of two sublayers, each about ¼ wavelength in optical thickness, based on a 550 nanometer design wavelength, but with one sublayer having a refractive index higher than that of the other sublayer (b) by flowing two reaction mixtures across said glass from about the center of a reaction zone through which the glass is

being moved and (c) so segregating the flow patterns of each of said mixtures that one said reaction mixture flows countercurrent to movement of said glass and the other reaction mixtures flow concurrently to movement of said glass.

4,612,218

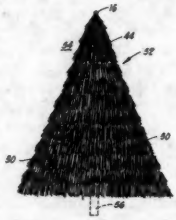
ARTIFICIAL CHRISTMAS TREES

Bettye J. Enterline, 8236 NW. 30th St., Bethany, Okla. 73008

Filed Sep. 30, 1985, Ser. No. 782,096

Int. Cl.[4] A47G *33/06*

U.S. Cl. 428—8 **9 Claims**



1. A device for attachment to a vertical structure for simulation of a Christmas tree, comprising:

a panel member formed of plastic sheet material that is rigid yet bendable and shaped in a generally triangular shape with an apex end and opposite end corners, and having a plurality of spaced apertures formed therethrough with said apertures formed in generally equi-spaced disposition over the entire panel area;

securing means for fastening said apex end on said vertical structure to support said panel member adjacent thereto; and

a plurality of limb fronds each having one end formed as an insert for secure affixture within a respective one of said apertures whereby said panel member and limb fronds effect said simulation.

4,612,219

INVISIBLE CHRISTMAS TREE

Anthony M. Tengs, 2001 Dexter Ave. N., Seattle, Wash. 98109, and Edna M. Gilbert, 6105 Camelback Manor Dr., Paradise Valley, Ariz. 85253

Filed Sep. 26, 1985, Ser. No. 780,262

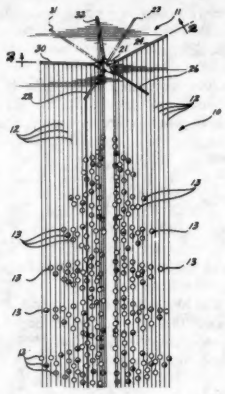
Int. Cl.[4] A47G *33/06*

U.S. Cl. 428—8 **16 Claims**

1. A Christmas tree mobile conveying the impression of an invisible coniferous tree, comprising:

(a) an overhead support member; and,

(b) a multiplicity of elongate elements attached to said overhead support member at spaced apart points so has to hang vertically from said overhead support member at spaced apart locations, each of said elongate elements including one or more attachment means for hanging ornaments from said elongate elements such that the ornaments define the tips of the branches of an invisible coniferous tree and, thus, the periphery of the tree.



4,612,220

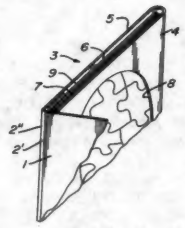
JIGSAW MESSAGE PADS

Gordon H. Baxter, 1 Paddock Close, Belton, Gt. Yarmouth, Norfolk, England

Filed Oct. 15, 1984, Ser. No. 660,947

Int. Cl.[4] B42D *15/04*; B65D *75/54*

U.S. Cl. 428—33 **9 Claims**



1. A jigsaw message pad, comprising:

a sheet having a writing surface and formed of interlocked but separable jigsaw puzzle pieces;

a sleeve having an open top end through which said sheet can be inserted and withdrawn and a closed bottom end adapted to retain said sheet when inserted into said sleeve, and having at least one window extending partially or wholly across at least one face thereof; and wherein through said window said writing surface can be seen and any message written thereupon can be read.

4,612,221

MULTILAYER FOOD WRAP WITH CLING

Edward N. Biel, Munster, Ind., and George F. Kirkpatrick, Downers Grove, Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 552,380, Nov. 16, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 810,908

Int. Cl.[4] B27N *5/02*

U.S. Cl. 428—35 **32 Claims**

1. A multilayer film suitable for use in microwave oven cooking consisting essentially of outer layers of a polyolefin

resin including a cling agent, each of said outer layers having a thickness of from about 0.1 mil to about 1.0 mil, said polyolefin resin being selected from the group consisting of polyethylene, polypropylene, and polybutylene, and a core layer of a thermoplastic resin having a melting point of at least about 335° F., resistance to heat, low permeability to oxygen, moisture and odor, and film toughness, said thermoplastic resin being selected from the group consisting of polyamides, polybutylene terephthalate, polyethylene terephthalate, ethylene-vinyl alcohol, and mixtures thereof.

4,612,222

POLYAMIDE ARTICLES RESISTANT TO HOT ANTIFREEZE COMPOSITIONS

John N. Gaitskell, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 29, 1984, Ser. No. 615,031

Claims priority, application United Kingdom, Jun. 24, 1983, 8317223

Int. Cl.⁴ B27N *5/02*

U.S. Cl. 428—35 **6 Claims**

1. A vehicle radiator end tank made from a reinforced composition comprising a polyamide selected from the group consisting of nylon 66, nylon 6 and nylon 610, or copolymers thereof, from 10% to 60% by weight of reinforcing filler and from 0.1 to 10% by weight of a copolymer formed from ethylenically unsaturated monomers and having functional groups extending from the polymer chain capable of reaction with the end groups of the polyamide wherein the copolymer contains up to 50 mole % of residues obtained from ethylenically unsaturated monomers containing functional groups.

4,612,223

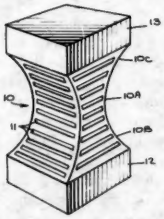
REVERSIBLE FRAGRANCE EMITTING UNIT

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed May 20, 1985, Ser. No. 736,141

Int. Cl.⁴ A61L *9/12*

U.S. Cl. 428—35 **7 Claims**



1. A reversible fragrance emitting unit adapted to rest on a flat surface in either an upright position in which the rate of fragrance emission is low and the unit is effectively "off", or in an upside down position in which the emission rate is high and the unit is "on", the unit comprising:

A a fenestrated open-ended shell;

B an inlet box attached to one end of the shell and having a bottom wall and an open top whereby this box communicates with the shell;

C an outlet box attached to the other end of the shell and having a bottom wall and a top wall whereby the interior of this box is sealed from the shell, said boxes in combination with said shell defining an interior chamber extending from the bottom wall of the inlet box to the top wall of the outlet box; and

D a charge of fragrance-emitting pellets entrapped in said chamber in an amount sufficient to substantially fill the inlet box when the unit is placed on the flat surface in its upright position, in which state there is relatively little emission from the charge into the atmosphere, the pellets occupying the fenestrated shell in the upside down position of the unit, in which state the emission rate is high.

4,612,224

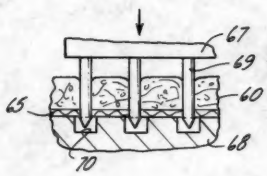
FIBER WEB FOR COMPRESSION MOLDING STRUCTURAL SUBSTRATES FOR PANELS

Alfred L. Davis, Thomson, Ga., assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Dec. 2, 1985, Ser. No. 803,282

Int. Cl.⁴ B32B *5/12*

U.S. Cl. 428—109 **5 Claims**



1. A fiber web for use in compression molding a panel structural substrate, comprising:

a relatively wide and thick mat formed of randomly disposed, non-woven fibers which are thoroughly intermixed;

an uncured molding plastic resin in powder form substantially uniformly disbursed and mixed within the fibers forming the mat;

a thin, non-woven fiber scrim sheet covering at least one of the two opposite faces of the mat;

and said fibers being mechanically interlocked together and to the scrim sheet by needling;

wherein, the web may be cut to pre-determined size and shapes for compression molding, under heat and pressure, within closed cavity molds to form stiff substrates for panels.

4,612,225

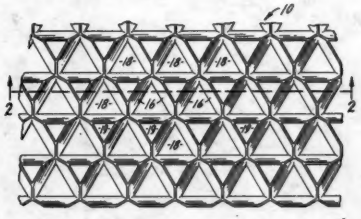
STRUCTURAL PANEL

Don E. Graffam, Barrington; Lawrence L. Lezon, Lake Zurich, and Arthur R. Slaters, Jr., Arlington Heights, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jul. 10, 1985, Ser. No. 753,702

Int. Cl.⁴ B32B *3/26, 27/00*

U.S. Cl. 428—116 **4 Claims**



1. A unitary, structural panel made in one piece of a thermoplastic material, said panel having width, length, and thickness dimensions and opposed substantially parallel faces spaced from one another by said thickness dimension;

said panel including planiform webs of a substantially uniform thickness that traverse the full thickness dimension of the panel and define a plurality of elongated, open channels that are substantially in axial alignment with one another; and

said panel having a bulk density of no more than about 1.1 kilograms per square meter per centimeter of thickness and a compressive strenth in the thickness direction of at least about 7 kilograms per square centimeter.

4,612,226

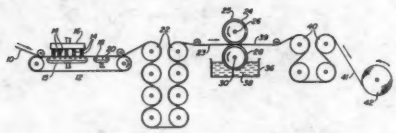
FABRIC HAVING EXCELLENT WIPING PROPERTIES

John W. Kennette, Somerville; Conrad C. Buyofsky, South River, and Alton H. Bassett, Princeton, all of N.J., assignors to Chicopee, New Brunswick, N.J.

Continuation-in-part of Ser. No. 341,924, Jan. 22, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,877

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—134 **5 Claims**



1. A nonwoven fabric comprising a substantially isotropic web comprising at least 70% rayon staple fibers characterized by said web having regions wherein the fibers of the web have been lightly entangled by the action of columnar jets of fluid, and said web containing a small amount of adhesive binder substantially uniformly distributed throughout said web, the amount of binder being sufficient to resist wet collapse of said web, and said fabric having an excellent balance of wiping properties, abrasion resistance, and softness; said fabric comprising two series of fibrous bands that are substantially perpendicular to each other, wherein each band in both series contains segments in which the individual fibers are all substantially parallel to each other, which segments alternate with regions in which the fibers have been randomly entangled, said regions occurring where an individual band of one series intersects an individual band of the other series, and wherein at regularly spaced intervals between the individual bands of both of said series there are openings in said fabric.

4,612,227

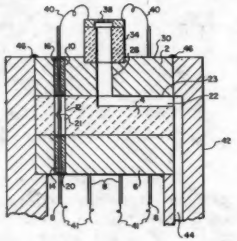
PRESSURE SENSOR HEADER

Ken Lam; John H. Pond, both of Colorado Springs, Colo., and Douglas W. Wilda, Ambler, Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1985, Ser. No. 809,662

Int. Cl.[4] B32B *3/10, 3/30;* **G01L** *9/08*

U.S. Cl. 428—137 **7 Claims**



1. A pressure sensor header comprising

a first metallic layer,

a second metallic layer,

an intermediate electrically non-conductive layer located between said first and second layers,

a radial groove on an outer surface of said ceramic layer extending to a peripheral surface of said ceramic layer,

a fluid port extending through said first layer communicating with an inner end of said radial groove and

means for retaining said first, second and intermediate layers in a fixed spatial orientation.

4,612,228

ULTRAFINE FIBER ENTANGLED SHEET

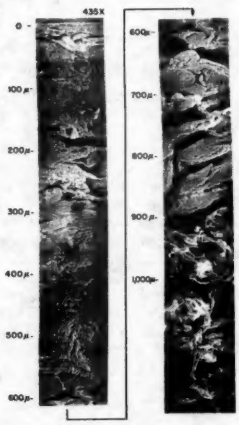
Hiroyasu Kato, Minami, and Kenkichi Yagi, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 479,970, Mar. 29, 1983, Pat. No. 4,476,186. This application Apr. 23, 1984, Ser. No. 602,270

Claims priority, application Japan, Mar. 31, 1982, 57-51119

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—151 **21 Claims**



1. Artificial grain leather comprising a sheet composed of a resin and a multiplicity of entangled synthetic fibers having a denier of less than about 0.5, said sheet having a body portion and having a grain surface portion wherein the fibers are superentangled at a multiplicity of entangling points,

the average distance between the entangling points in said grain surface portion being less than about 200 microns,

and the fiber density coefficient, when measured at a surface portion of 30 microns thickness, being greater than about 30.

4,612,229

PROCESS FOR PREPARING FIBRILLATED FILMS OR NETLIKE STRUCTURES OF SYNTHETIC POLYMERS

Andrea Vittone, Milan; Pierpaolo Camprincoli, Terni, and Adriano Grandona, Milan, all of Italy, assignors to Montedison S.p.A. and Moplefan S.p.A., both of Milan, Italy

Continuation of Ser. No. 526,806, Aug. 26, 1983, abandoned, which is a division of Ser. No. 435,277, Oct. 19, 1982, abandoned, which is a continuation of Ser. No. 150,709, May 19, 1980, abandoned. This application Jul. 25, 1984, Ser. No. 634,386

Claims priority, application Italy, May 18, 1979, 22,801 A/79

Int. Cl.[4] B29C *67/22, 55/06*

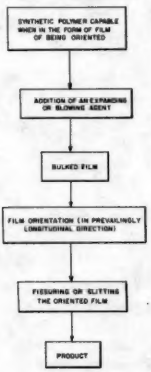
U.S. Cl. 428—155 **5 Claims**

1. Process for preparing fibrillated films or flat netlike structures of synthetic polymers and having a specific surface area of more than 12 m^2/g., the thickness thereof in microns, said process consisting of the following operations:

(a) preparing a film of at least one orientable synthetic polymer containing an expanding of bulking agent;

(b) expanding the expanding or bulking agent contained in the film;

(c) longitudinally or prevailingly longitudinally orienting the expanded film, by stretching with a longitudinal stretch ratio comprised between 3 and 15, with the formation of an oriented film 20 to 200μ thick; and


SYNTHETIC POLYMER CAPABLE WHEN IN THE FORM OF FILM OF BEING ORIENTED
ADDITION OF AN EXPANDING OR BLOWING AGENT
BULKED FILM
FILM ORIENTATION (IN PREVAILINGLY LONGITUDINAL DIRECTION)
FISSURING OR SLITTING THE ORIENTED FILM
PRODUCT

(d) fissuring or slitting the oriented film.

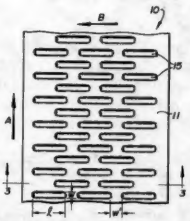
5. Plates and manufacured articles based on hydrosetting binders containing fibrillated films or flat, netlike structures obtained by the process of claim 1.

4,612,230

SURGICAL WOUND CLOSURE TAPE

Alfred Liland, Wharton, and Donald W. Regula, Flagtown, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 17, 1986, Ser. No. 819,577
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—167 **4 Claims**



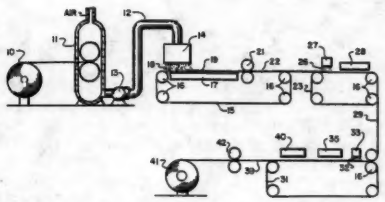
1. A surgical wound closure tape, said tape having a longitudinal direction and a transverse direction, said tape comprising a substrate of a nonwoven fabric, one surface of said substrate being smooth and having a pressure-sensitive adhesive uniformly disposed over said smooth surface, the opposite surface of said substrate having a plurality of indentations disposed over said surface, each indentation being rectangular in shape, each said rectangle having a length of at least 5 times the width of said rectangle, said rectangles being disposed in parallel rows with the length of each rectangle extending in the transverse direction of the tape, the rectangles in adjacent rows being in overlapping relationship with each rectangle spaced from all adjacent rectangles by a distance equal to or greater than the width of the rectangle whereby said tape has good elasticity, drape, abrasion resistance, tensile strength, and a reduced propensity to curl at the edges of the tape.

4,612,231

PATTERNED DRY LAID FIBROUS WEB PRODUCTS OF ENHANCED ABSORBENCY

Michael P. Bouchette; Johannes A. Van den Akker, both of Appleton, Wis., and William R. Watt, Princeton Junction, N.J., assignors to James River-Dixie Northern, Inc., Norwalk, Conn.

Division of Ser. No. 309,015, Oct. 5, 1981, abandoned. This application Sep. 24, 1984, Ser. No. 653,836
Int. Cl.[4] A61F *13/16*; B32B *5/12*
U.S. Cl. 428—167 **11 Claims**



1. A dry laid fibrous web product of high bulk and enhanced absorbency rate comprising:

(a) a dry laid web of randomly distributed wood pulp fibers;

(b) an adhesive material substantially permeating said web, adjacent fibers being bonded to one another thereby, and

(c) an imprinted pattern on at least one surface of said web, the pattern subdividing said surface into compacted regions and non-compacted regions in alternating relationship to one another, the area of the compacted regions being between about 50% and about 80% of each imprinted surface, the compacted regions having a density in the range of about 0.2 g/cc to about 0.5 g/cc;

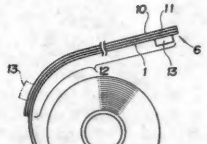
whereby the portions of the web product underlying the compacted regions are compressed and densified reducing thereby the interstitial voids between adjacent fibers within said densified portions so that wiping absorbency is enhanced by increasing capillary tension and promoting wicking.

4,612,232

ROLLED THERMAL TRANSFER CARBON RIBBON STRUCTURE WITH LEAD TAPE

Takeshi Obara, Nigata; Toshirou Gotou, and Kazuyuki Kobayashi, both of Iwate, all of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jan. 2, 1985, Ser. No. 688,435
Claims priority, application Japan, Feb. 23, 1984, 59-23810[U]
Int. Cl.[4] B32B *3/16*; B65H *81/06*; C09J *7/02*
U.S. Cl. 428—172 **12 Claims**



1. A rolled web with lead tape comprising:

a rolled web, including a first leading end, which is the outermost free end of the rolled web, and a leading end portion at the leading end; said rolled web being in the form of a thermal transfer carbon ribbon web; and

a lead tape including a base layer and a pressure-sensitive adhesive layer backing the base layer; the lead tape adhesive layer being adhered to the outer surface of the outermost circumference of the rolled web and overlapping the whole leading free end of the rolled web; the lead tape having a respective second leading end thereof; the second leading end being substantially coextensive with the first leading end of the web to which the lead tape is adhered, for strengthening the leading end portion of the web and prevent tearing between the lead tape and the carbon ribbon, and the lead tape wrapping around the outermost circumference of the web for further protecting the web.

4,612,233

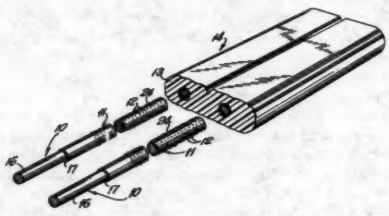
PLASTIC-COATED METALLIC MEMBERS

Albert Kiersarsky, Howard County; Earl S. Sauer, Baltimore County; William Vesperman, Howard County, and Max K. Wilson, Baltimore, all of Md., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 569,532, Jan. 9, 1934, Pat. No. 4,541,980. This application Feb. 28, 1985, Ser. No. 706,828

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—206 **3 Claims**



1. An article of manufacture which comprises a metallic member, and a relatively-stable, texturized, discontinuous coating of adhesion sites on at least a portion of the surface of a metallic member, the adhesion sites including unplasticized PVC material, the portions of the unplasticized PVC material contacting the surface of the metallic member having undergone controlled degradation, having fused to and having a controlled degree of adherence to the surface of the metallic member, said discontinuous coating produced by a process comprising passing the metallic member through a coating zone for deposition of a discontinuous coating of unplasticized PVC material on the member, and removing the member from said coating zone while the coating of unplasticized PVC material is still discontinuous.

4,612,234

ANTI-REFLECTION COATING FILM SUITABLE FOR APPLICATION ON OPTICS MADE OF MIXED CRYSTALS OF THALLIUM IODIDE AND THALLIUM BROMIDE

Takeo Miyata; Takuhiro Ono, both of Zama, and Takeshi Iwabuchi, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

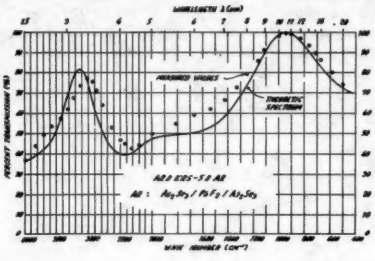
Filed Jan. 26, 1984, Ser. No. 574,284

Claims priority, application Japan, Jan. 27, 1983, 58-11768

Int. Cl.[4] B32B *7/00*; G02B *5/26*

U.S. Cl. 428—215 **4 Claims**

1. A transparent optic comprising a substrate comprising a mixed crystal of thallium iodide and thallium bromide having deposited on surfaces thereof, through which a light beam is passed, an anti-reflective film comprising, deposited on the surfaces, a first arsenic triselenide layer, a second lead fluoride layer and a third arsenic triselenide layer for protection of said



second lead fluoride layer arranged on each surface in this order.

4,612,235

MAGNETIC RECORDING MEDIUM

Akira Ushimaru; Masaaki Fujiyama; Toshimitu Okutu, and Takahito Miyoshi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 509,146, Jun. 29, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,757

Claims priority, application Japan, Jun. 29, 1982, 57-110691

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—216 **5 Claims**

1. A magnetic recording medium comprising a magnetic recording layer on one side of a non-magnetic support and, on the other side thereof, a back layer having a maximum thickness of 2μ, and containing inorganic powder selected from at least one member of the following group: carbon black, graphite, tungsten disulfide, molybdenum disulfide, boron nitride, SiO_2, $CaCO_3$, Al_2O_3, Fe_2O_3, TiO_2, MgO, AnO, CaO, in a combination of fine grains of 50 to 1000 Å and coarse grains of 0.1 to 1.5μ, so as to form, on the surface of the back layer, surface projections with a height of 0.1 to 0.5μ, an interval of 50 to 300μ and 2,000 to 12,000 projections/cm^2.

4,612,236

COATING FOR INCREASING CORROSION RESISTANCE AND REDUCING HYDROGEN REEMBRITTLEMENT OF METAL ARTICLES

Grace F. Hsu, Issaquah, and Richard C. Colonel, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 537,335, Sep. 29, 1983, Pat. No. 4,529,487. This application May 20, 1985, Ser. No. 735,595

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—216 **18 Claims**

1. A plated metallic article exhibiting high corrosion resistance and low hydrogen embrittlement and reembrittlement characteristics comprising:

a metal substrate,

a metallic plated coating providing high corrosion resistance and low hydrogen embrittlement adhered to said substrate, said coating comprising a metal or metal alloy, or combination of metal alloys, and

a polymeric coating providing high corrosion resistance and low hydrogen reembrittlement adherently overlying said plated coating comprising a metal or metal alloy, or combination of metal alloys, and

a polymeric coating providing high corrosion resistance and low hydrogen reembrittlement adherently overlying said plated coating comprising a water insoluble acrylic polymer.

12. The method for producing a corrosion resistant and low hydrogen embrittlement and reembrittlement resistant coating on a metal article comprising the step of coating a metal sub-

strate to be protected from corrosion or hydrogen embrittlement with a coating solution comprising a water insoluble acrylic polymer, benzotriazole, and a solvent therefore.

4,612,237

HYDRAULICALLY ENTANGLED PTFE/GLASS FILTER FELT

Peter E. Frankenburg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1985, Ser. No. 808,752
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—219 31 Claims

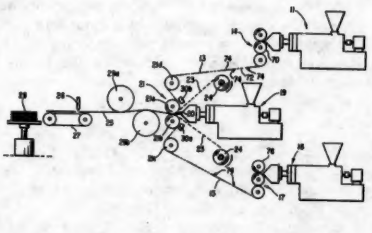
1. A felt having a basis weight of 150–600 g/m^2 suitable for use as a filter comprising: a uniformly dispersed sheet-like structure containing 40–95 percent by weight poly(tetrafuoroethylene) fibers having a linear density per filament of 3–8 dtex, 5–60 percent by weight glass fibers having a linear density per filament of 0.2–1.5 dtex, hydraulically entangled into supporting scrim.

4,612,238

FIBER REINFORCED MULTI-PLY STAMPABLE THERMOPLASTIC SHEET

Michael P. DellaVecchia, Sparta; Joseph E. Mackey, East Hanover, and Albert H. Steinberg, Morris Plains, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 129,298, Mar. 11, 1980, abandoned, which is a continuation of Ser. No. 816,630, Jul. 18, 1977, abandoned. This application Apr. 8, 1983, Ser. No. 481,445
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—228 9 Claims



1. A composite laminated sheet which consists essentially of at least one layer further comprising 50 to 100 percent of a synthetic thermoplastic polymer, 0 to 5 percent of a particulate filler, and 0 to 45 percent short glass fibers, the one layer having a plurality of projections on an embossed surface the thickness of the one layer being at least 10 mils greater than the height of the projections;

a reinforcing layer further comprising 50 to 100 percent of a synthetic thermoplastic polymer on an extruded basis, a long glass fiber mat, and 0 to 50 percent particulate filler on an extruded basis, the reinforcing layer adjoining the embossed surface of the one layer, whereby the long glass fiber mat is positioned by the projections of the one layer and becomes substantially encased in the synthetic thermoplastic polymer of the reinforcing layer, the sole means to position the long glass fiber mat being the embossed projections of the one layer.

2. A composite laminated sheet which consists essentially of one layer further comprising 50 to 100 percent of a synthetic thermoplastic polymer, 0 to 50 percent of a particulate filler, and 0 to 45 percent short glass fibers, the one layer having a plurality of projections on an embossed surface;

a similar layer further comprising 50 to 100 percent of a synthetic thermoplastic polymer, 0 to 50 percent of a particulate filler, and 0 to 45 percent short glass fibers, the similar layer having a plurality of projections on an embossed surface;

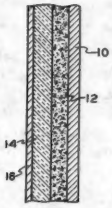
a reinforcing layer further comprising 50 to 100 percent of a synthetic thermoplastic polymer on an extruded basis, a long glass fiber mat, and 0 to 50 percent particulate filler on an extruded basis, the reinforcing layer being located between the one layer and the similar layer with opposite surfaces of the reinforcing layer adjoining the embossed surface of the one layer and the embossed surface of the similar layer, whereby the long glass fiber mat is positioned between the projections of the one layer and similar layer and becomes substantially encased in the synthetic thermoplastic polymer of the reinforcing layer the sole means to position the long glass fiber mat being the embossed projections of the one layer and the similar layer.

4,612,239

ARTICLES FOR PROVIDING FIRE PROTECTION

Felix Dimanshteyn, 12 Sioux La., West Hartford, Conn. 06117

Continuation-in-part of Ser. No. 466,378, Feb. 15, 1983, abandoned. This application May 10, 1984, Ser. No. 608,728
Int. Cl.[4] C09K *21/08;* A62D *1/06;* B27N *9/00*
U.S. Cl. 428—246 25 Claims



1. A fire protection article comprising:

an extinguishing/coolant agent, said agent comprising a dry material which is stable at room temperature and which will undergo an endothermic reaction to generate a non-toxic and non-flammable gas while simultaneously absorbing heat when subjected to an elevated temperature, said extinguishing/coolant agent being selected from the group consisting of sodium bicarbonate, potassium bicarbonate, borax, monoammonium phosphate and urea potassium bicarbonate;

a non-flammable and non-toxic adhesive, said adhesive and agent being intimately mixed and cured to define a non-porous layer having the agent uniformly dispersed therein, said adhesive being selected from the group consisting of neoprene elastomer, latex modified elastomer emulsions, synthetic elastomers and polyvinyl alcohol; and

a thermal barrier layer, said barrier layer being comprised of a gas permeable fabric and being at least partly bonded to a first surface of said non-porous layer, said fabric being non-flammable and retaining its dimensional stability at temperatures above the temperature at which said agent undergoes an endothermic reaction, said fabric being comprised of fibers selected from the group consisting of glass, graphite and ceramic.

4,612,240

THERMALLY MATCHED COATINGS FOR CERAMIC FIBER INSULATION

Thomas A. Johnson, Lynchburg, and Charles A. Hill, Amherst, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 564,435, Dec. 21, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 721,505
Int. Cl.[4] C04B 35/14
U.S. Cl. 428—289 3 Claims

1. A fiber-free refractory coating composition for a ceramic fiber insulation for use as a high temperature lining which consists essentially of a ceramic fiber substrate and a coating of the coating composition, said coating composition consisting essentially by weight of 0 to 46.2% of an aluminosilicate mineral selected from the group consisting of kyanite, andalusite, and sillimanite; 17.6 to 60% alumina; 2.9 to 5.7% colloidal silica; and 22.9 to 66.4% water and wherein said ceramic fiber substrate consists essentially of aluminosilicate fiber, high-alumina fiber and organic binders.

3. A process for producing a ceramic fiber insulation having a ceramic fiber substrate and a coating of a fiber-free refractory coating composition for use as a high-temperature lining characterized by good adhesion to a substrate material and excellent resistance to severe thermal shock and chemical attack, comprising the steps of:

mixing together an aluminosilicate mineral, alumina, and colloidal silica, the aluminosilicate mineral selected from the group consisting of kyanite, andalusite, and sillimanite;

adding water to the mixture to form an aqueous mixture;

then applying a coating of the aqueous mixture to the ceramic fiber substrate, wherein said ceramic fiber substrate consists essentially of aluminosilicate fiber, high-aluminum fiber and organic binders; and

drying the mixture on the substrate.

4,612,241

IMPACT RESISTANT COMPOSITES WITH ELASTOMERIC FIBERS

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 12, 1985, Ser. No. 743,901
Int. Cl.[4] B32B 27/02, 27/04; C08K 7/12
U.S. Cl. 428—294 26 Claims

1. An impact resistant composite consisting essentially of a polymer or polymer precursor and oriented thermoplastic elastomeric fibers:

said polymer or polymer precursor being compatible with and adhesive to said thermoplastic elastomeric fibers, and forming, without said thermoplastic elastomeric fibers, a neat polymer matrix having an elongation of less than about 10%;

said thermoplastic elastomeric fibers being (a) during preparation of said composite, embedded in said polymer or polymer precursor under from about 0 tension to tension only sufficient to eliminate slack, (b) capable of developing tension when embedded in said polymer or polymer precursor, and (c) present in said composite in an amount of from about 1 to about 95 percent by weight of composite; and

said composite having an elongation of at least 10% greater than the elongation of the neat polymer matrix.

21. A process for preparing an impact resistant composite consisting essentially of a polymer or polymer precursor and oriented thermoplastic elastomeric fibers comprising the steps of:

(a) embedding said thermoplastic elastomeric fibers in said polymer or polymer precursor under from about 0 tension to tension only sufficient to eliminate slack; and

(b) hardening said polymer or polymer precursor to form a composite;

said polymer or polymer precursor being compatible with and adhesive to said thermoplastic elastomeric fibers, and forming, without said thermoplastic elastomeric fibers, a neat polymer matrix having an elongation of less than about 10%; and said thermoplastic elastomeric fibers being (a) capable of developing tension when embedded in said polymer or polymer precursor, and (b) present in said composite in an amount of from about 2 to about 95 percent by weight of composite.

4,612,242

PRESSURE-SENSITIVE ADHESIVE TAPE CONTAINING COATED GLASS MICROBUBBLES

George F. Vesley, Hudson; Patrick G. Zimmerman, St. Paul; Craig S. Chamberlain, Woodbury, and Jerome W. McAllister, Hudson, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 3, 1985, Ser. No. 740,576
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—313.9 15 Claims

1. Pressure-sensitive adhesive tape comprising a pressure-sensitive adhesive layer consisting essentially of a polymeric pressure-sensitive adhesive matrix and glass microbubbles having an average density not exceeding 1.0, which microbubbles comprise at least 5% by volume of the adhesive layer, wherein the improvement comprises:

the microbubbles have an inorganic thin-film coating of an average thickness from 0.05 to 30 nm, but not of a thickness that would unduly inhibit polymerization of the adhesive layer by ultraviolet radiation.

4,612,243

REUSABLE HEAT-SENSITIVE TRANSFER ELEMENT

Yoshikazu Shimazaki, Osaka; Suekichi Shimizu, Takatsuki, and Nobuyuki Nakajima, Nara, all of Japan, assignors to Fuji Kagakushi Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,352
Claims priority, application Japan, Jun. 26, 1984, 59-131455
Int. Cl.[4] B41M 5/025; B32B 5/16
U.S. Cl. 428—321.3 11 Claims

1. A reusable heat-sensitive transfer recording element comprising a foundation having thereon an ink-containing layer comprising porous particles having an average particle size of from about 1 to 20 μm and an average porosity of from about 50% to 97%, said particles being impregnated with a heat-meltable ink which is heat-transferable in increments during repeated use, and a binder material which binds said particles to each other and to said foundation, said binder material being substantially incompatible with said heat-meltable ink and being non-meltable under conditions of use.

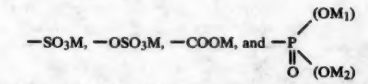
4,612,244

MAGNETIC RECORDING MEDIUM

Koji Kaneda, Dothan, Ala., and Masayoshi Sugiyama, Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,227
Claims priority, application Japan, Oct. 4, 1983, 58-184403
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—323 7 Claims

1. A magnetic recording medium comprising a non-magnetizable substrate, a magnetic layer formed on one surface of said non-magnetizable substrate and a back coating layer composed of a binder and non-magnetizable pigment formed on the other surface of said non-magnetizable substrate, said binder being composed of at least one of a polyester resin having hydrophilic groups and a polyurethane resin having hydrophilic groups, in an amount of at least 80% by weight of said binder, said hydrophilic groups being selected from the group consisting of groups having the general formulas:



wherein M is hydrogen, lithium, sodium, or potassium; and M_1

and M_2 are hydrogen, lithium, sodium, potassium or alkyl groups, said hydrophilic groups being present in said resin in an amount between 0.01 and 2.0 mg equivalents/g and said non-magnetizable pigment being composed of carbon black having a mean particle diameter between 0.02 and 0.1 micron, and non-magnetizable pigment having Mohs hardness not less than 5, the weight ratio of said carbon black to said non-magnetizable pigment being from 60:40 to 95:5.

4,612,245

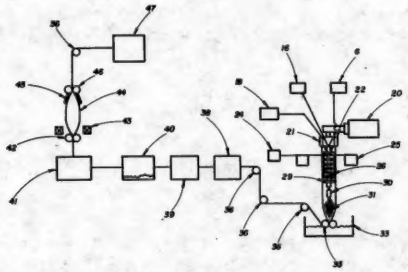
BLOWN BUBBLE PROCESS FOR PRODUCING ORIENTED THIN FILMS

Walter B. Mueller, Taylors, and Julian H. Schoenberg, Greenville, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 523,294, Aug. 15, 1983, abandoned, which is a continuation of Ser. No. 289,018, Jul. 31, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 654,581

Int. Cl.[4] B32B *27/32, 31/02*

U.S. Cl. 428—340 **18 Claims**



1. In the blown bubble process for processing a polyolefin material extruded as a tube having a heat sealable interior surface layer, the improvement comprising the following steps in the order given:

spraying a coating of from 1 milligram to 20 milligrams of a polyorganoxiloxane per square foot of said interior surface layer; then

collapsing said extruded tube into a layflat arrangement;

irradiating the collapsed tube;

heating the collapsed tube to its orientation temperature; and

expanding the collapsed tube by formation of a bubble;

whereby welding of the interior surface layer of the collapsed tube to itself is greatly reduced and the heat sealability of the interior surface layer to itself is improved.

14. A polyolefin film formed by a process comprising, in the order given, the steps of:

extruding a polyolefin material as a tube having a heat sealable interior surface layer;

passing said tube over an air mandrel;

providing a coating of from 1 milligram to 20 milligrams of a polyorganosiloxane per square foot of said interior surface layer; then

collapsing the tube into a lay-flat arrangement;

irradiating the collapsed tube;

heating the collapsed tube to its orientation temperature;

expanding said polyolefin material to form a tube having an interior surface layer having a coating from 0.036 milligram to 0.741 milligrams of said polyorganosiloxane per square foot of said interior surface layer; and

slitting the tube to form a film wherein said heat sealable interior surface layer is a surface of said film and is adapted to form an improved heat seal with itself of at least about 5.7 lbs./in.

4,612,246

LUBRICATED POLYESTER ENAMELED ELECTRICAL CONDUCTORS

Newton N. Goldberg, Penn Hills Township, Allegheny County, and Jacques S. Merian, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1985, Ser. No. 714,609

Int. Cl.[4] B32B *15/00, 27/00;* **H01B** *7/00*

U.S. Cl. 428—379 **14 Claims**

1. An electrical conductor having a lubricated surface coating of a cured polyester enamel, the enamel comprising at least one reacted blend of components, the blend of components comprising:

(A) a polycarboxylic acid component comprising at least a portion of aromatic dicarboxylic acid, and

(B) hydroxyl components comprising a fluorinated aliphatic alcohol, and one or more non-fluorinated polyols wherein at least a portion of said polyols is tris (2-hydroxy alkyl) isocyanurate, where the fluorinated aliphatic alcohol has a perfluoroalkyl group of from 4 carbon atoms to 12 carbon atoms and constitutes from 8 wt. % to 30 wt. % of the total fluorinated alcohol plus non-fluorinated polyol content of the enamel.

4,612,247

MAGNETIC CELLULOSE-DERIVATIVE STRUCTURES

Myles A. Walsh, Falmouth, and Robert S. Morris, Fairhaven, both of Mass., assignors to Cape Cod Research, Inc., Buzzards Bay, Mass.

Filed Jun. 27, 1984, Ser. No. 624,956

Int. Cl.[4] B32B *5/16;* **C12N** *1/02*

U.S. Cl. 428—402 **17 Claims**

1. A porous magnetic structure containing at least one reactive agent comprising:

(a) a shell formed of a microporous water-insoluble cellulose derivative, having a microporous matrix, the shell ranging in diameter from 5 to 1000 microns;

(b) one or more magnetic particles having diameters of less than 50 microns and which are encapsulated in the shell in an amount of at least 0.1 percent by weight of the shell; and

(c) at least one reactive agent supported within the microporous matrix of the cellulose derivative shell, for selectively extracting specific materials from the aqueous solution to be treated.

4,612,248

TREATMENT OF POLYMER USING SILVER

Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 479,243, Mar. 28, 1983, Pat. No. 4,540,631. This application Jun. 10, 1985, Ser. No. 743,220

Int. Cl.[4] B32B *15/08, 27/06*

U.S. Cl. 428—419 **2 Claims**

1. An article of manufacture comprising a film of silver on a poly(arylene sulfide) substrate.

4,612,249

BONDING POLYURETHANES TO POLYOLEFINS

Marvin Packer, Marple Township, Delaware County, and John X. Fritz, E. Pikeland Township, Chester County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 685,240

Int. Cl.[4] B05D *3/08*

U.S. Cl. 428—424.8 **11 Claims**

1. A process for producing a bond between a polyolefin substrate and a polyurethane comprising:

(a) forming on the polyolefin substrate a coating consisting essentially of a graft copolymer of a polyolefin and an acrylate monomer;

(b) flame treating the coating for a time sufficient to fuse the graft copolymer to the substrate;

(c) applying to said fused coating a liquid polyurethane precursor composition; and
(d) curing said composition.

4,612,250
PRODUCTION PROCESS FOR HIGHLY WATER ABSORBABLE POLYMER

Hisao Takeda, Zama, and Yasunori Taniguchi, Samukawamachi, both of Japan, assignors to American Colloid Company, Skokie, Ill.

Division of Ser. No. 460,037, Jan. 21, 1983, Pat. No. 4,525,527. This application Mar. 11, 1985, Ser. No. 710,702
Claims priority, application Japan, Jan. 25, 1982, 57-8983; Mar. 9, 1982, 57-035913; Mar. 9, 1982, 57-035914
Int. Cl.[4] B32B *27/00*; C08F *220/06*
U.S. Cl. 428—500 **13 Claims**

1. A method of absorbing water comprising mixing a monomer solution of (A) acrylic acid, neutralized 70 to 100 mole percent, (B) acrylamide in a mole ratio of acrylic acid:acrylamide in the range of 70:30 to 100:0; (C) a water soluble or water miscible polyvinyl monomer cross-linking agent in an amount of 0.001 to 0.3 percent by weight of (A) plus (B); and water to form a mixed monomer solution, wherein the monomers of the mixed monomer solution consist essentially of (A), (B) and (C) and the monomer concentration is at least 70 percent by weight of the monomer solution prior to polymerization initiation; and initiating polymerization of monomers (A) and (B) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to form a water absorbing cross-linked polyacrylate resin having a water content of 15 percent by weight or less, and thereafter contacting said resin with water to absorb water into said resin.

4,612,251
PAPER SHEET HAVING A VERY HIGH PROPORTION OF LATEX, PROCESS FOR PREPARING SAME AND APPLICATIONS THEREOF PARTICULARLY AS A SUBSTITUTION PRODUCT FOR IMPREGNATED GLASS WEBS

Pierre Fredenucci, and Jean-Bènard Berhaut, both of Charavines, France, assignors to Arjomari-Prioux, Paris, France

Filed Jul. 13, 1983, Ser. No. 513,432
Claims priority, application France, Jul. 30, 1982, 82 13391; Nov. 5, 1982, 82 18624
Int. Cl.[4] B32B *23/08*
U.S. Cl. 428—511 **15 Claims**

1. A paper sheet characterized in that said sheet was prepared according to a paper making process from a composition comprising about 45–140 parts by dry weight of a fibrous mixture comprising about 30–90 parts by dry weight of cellulosic fibers and 15–50 parts by dry weight of mineral fibers per 100 parts by dry weight of a latex.

4,612,252
LAMINATED STRUCTURE HAVING POST-CHLORINATED ADHESIVE OLEFIN RESIN LAYER

Toshihiro Sagane, Yamaguchi, and Riichiro Nagano, Hiroshima, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,168
Claims priority, application Japan, Dec. 21, 1983, 58-239668
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—516 **17 Claims**

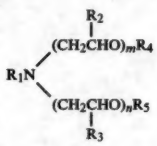
1. In a laminated structure comprised of two adjoining layers of synthetic resin laminated through a layer of a post-halogenated adhesive olefin resin of an alpha-olefin having 2 to 8 carbon atoms, the improvement wherein said post-halogenated adhesive olefin resin has a halogen content of 0.1 to less than 10% by weight based on its own weight and a crystallinity, determined by the X-ray diffraction method, of 5 to 30%, and is obtained by the post-halogenation of an unhalogenated olefin resin having a crystallinity, determined by the X-ray diffraction method, of 10 to 45%.

4,612,253
RESIN COMPOSITION AND PLATED ARTICLE THEREOF

Tetsuro Maeda; Kyoji Onaya, and Akihiro Okamoto, all of Chiba, Japan, assignors to Denki Kagaku Kogyo K. K., Chiba, Japan

Filed Mar. 15, 1985, Ser. No. 712,066
Claims priority, application Japan, Mar. 15, 1984, 59-50090; Mar. 22, 1984, 59-54859
Int. Cl.[4] C08J *7/06*
U.S. Cl. 428—521 **5 Claims**

1. A plated resin article formed by wet-plating a molded article composed of a resin composition comprising 100 parts by weight of an acrylonitrile-butadiene-styrene resin containing a conjugated diene type rubber, wherein the acrylonitrile-butadiene-styrene resin comprises 5 to 30% by weight of a conjugated diene type rubber, 40 to 80% by weight of an aromatic vinyl compound, 10 to 40% by weight of a vinyl cyanide compound, and 0.1 to 10 parts by weight of a compound represented by the following general formula [I]:



[I]

wherein R_1 stands for an alkyl group, R_2 and R_3 each stand for a hydrogen atom or a methyl group, R_4 and R_5 each stand for a hydrogen atom or a group —C(O)R_6 in which R_6 stands for an alkyl group, and m an n are integers of form 1 to 20.

4,612,254
AROMATIC CARBOXYLIC ACID AND METAL-MODIFIED PHENOLIC RESINS AND METHODS OF PREPARATION

James W. Ginter, Cheektowaga; Donald H. Thorpe, Williamsville, and Victor F. G. Cooke, Youngstown, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 7, 1985, Ser. No. 709,461
Int. Cl.[4] C08G *8/32*; C08L *61/14*
U.S. Cl. 428—531 **74 Claims**

1. A metal-modified phenolic resin which comprises a reaction product of:
(a) a substantially non-novolak oligomer of a phenol, which does not contain a carboxyl group, and an aldehyde;
(b) an aromatic carboxylic acid; and
(c) a metal-containing compound, said oligomer having at least one reactive group thereon for reacting with said aromatic carboxylic acid.

4,612,255
WATER DISPERSIBLE COMPOSITIONS FOR PREPARING AQUEOUS WATER REPELLENT SYSTEMS, AQUEOUS WATER REPELLENT SYSTEMS, AND PROCESS FOR TREATMENT OF PERMEABLE SUBSTRATES THEREWITH

Richard W. Hein, Hudson, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Dec. 18, 1984, Ser. No. 682,784
Int. Cl.[4] B05D *1/18*; C09D *5/16, 5/18*
U.S. Cl. 428—541 **28 Claims**

10. An aqueous water repellent system having fungicidal properties comprising

(a) from about 0.01 to about 5% by weight of a paraffinic wax,
(b) a fungicidally effective amount of at least one one oil-soluble metal salt of an organic carboxylic acid,
(c) from about 0.05 to about 10% by weight of at least one surfactant,
(d) up to about 30% by weight of at least one hydrocarbon solvent, and
(e) from about 25 to about 99% by weight of water.

18. A method of imparting water repellency and fungicidal properties to permeable substrates comprising the steps of:
(a) contacting the substrate with the aqueous system of claim **10** for a period of time sufficient to enable the metal salt to penetrate into the substrate, and
(b) removing said substrate from contact with said aqueous mixture.

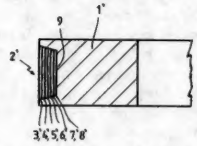
19. The method of claim **18** wherein the substrate is wood.

25. Wood treated in accordance with the method of claim **19**.

4,612,256
WEAR-RESISTANT COATING

Hans J. Neuhäuser, Bergisch-Gladbach; Ulrich Buran, Burscheid, and Manfred Fischer, Leichlingen, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,484
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315556
Int. Cl.[4] **B22F** *3/00;* **C25D** *13/00;* **B05D** *1/36*
U.S. Cl. 428—547 **24 Claims**



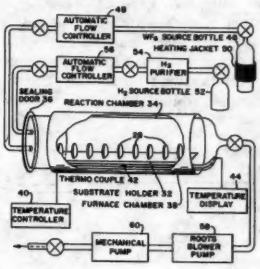
1. Wear-resistant coating on a machine part which is subject to friction wear, said coating being applied by a flame spraying process and comprising five sprayed-on layers formed of successively applied spray powder mixtures, comprising, in succession, starting from the machine part surface to which said coating is applied:
25% Mo, 50% Mo_2C and/or Cr_3C_2 and 25% binder metal;
35% Mo, 40% Mo_2C and/or Cr_3C_2 and 25% binder metal;
45% Mo, 30% Mo_2C and/or Cr_3C_2 and 25% binder metal;
55% Mo, 20% Mo_2C and/or Cr_3C_2 and 25% binder metal; and
65% Mo, 10% Mo_2C and/or Cr_3C_2 and 25% binder metal.

4,612,257
ELECTRICAL INTERCONNECTION FOR SEMICONDUCTOR INTEGRATED CIRCUITS

Eliot K. Broadbent, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 490,381, May 2, 1983, Pat. No. 4,517,225. This application Oct. 9, 1984, Ser. No. 659,068
Int. Cl.[4] **H01L** *21/285, 21/30*
U.S. Cl. 428—620 **8 Claims**

1. An electrical interconnection structure of an electrical device in which a first patterned electrically conductive layer lies over a first electrically insulating layer, a second electrically insulating layer lies over the first conductive layer and over adjacent material of the first insulating layer not underlying the first conductive layer, and an aperture extends through the second insulating layer down to a surface portion of the first conductive layer, the improvement comprising:
an intermediate electrically conductive layer which consists essentially of tungsten and lies on the surface portion, any

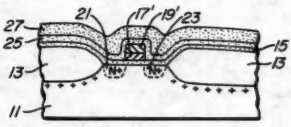


tungsten on nearby material of the second insulating layer being electrically inconsequential; and
a patterned second electrically conductive layer on material of the second insulating layer and on at least part of the intermediate conductive layer.

4,612,258
METHOD FOR THERMALLY OXIDIZING POLYCIDE SUBSTRATES IN A DRY OXYGEN ENVIRONMENT AND SEMICONDUCTOR CIRCUIT STRUCTURES PRODUCED THEREBY

Juine-Kai Tsang, Sunnyvale, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Dec. 21, 1984, Ser. No. 684,911
Int. Cl.[4] **H01L** *29/12;* **B05D** *5/12*
U.S. Cl. 428—620 **17 Claims**



1. A method of thermally oxidizing a polycide substrate in a dry oxygen environment, comprising the steps of:
emplacing a polycide substrate in a substantially enclosed chamber, said polycide substrate having a metallic silicide layer and an underlying layer of polycrystalline silicon;
filling said chamber with oxygen gas;
heating said substrate to temperature of at least 800 degrees Centigrade for a predetermined length of time; and
introducing into said chamber an amount of a halogenated hydrocarbon gas sufficient to induce oxidation of said substrate, whereby a silicon dioxide layer is provided thereon.

4,612,259
TITANIUM CLAD STEEL PLATE

Fumihide Ueda, Shiga, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1982, Ser. No. 354,250
Claims priority, application Japan, Mar. 5, 1981, 56-30549; Mar. 17, 1981, 56-37289; May 20, 1981, 56-75035; Aug. 12, 1981, 56-125322; Sep. 7, 1981, 56-139845
Int. Cl.[4] **B23K** *20/04, 20/08*
U.S. Cl. 428—661 **8 Claims**

1. A method for manufacturing a titanium clad steel plate,

comprising explosive bonding a cladding metal plate consisting of pure titanium having a titanium content of at least about 99.4% by weight, a first intermediate plate of a metal selected from tantalum, a tantalum alloy, niobium and a niobium alloy and a second intermediate plate of a metal selected from copper, a copper alloy, nickel and a nickel alloy, and a base metal plate consisting of carbon steel so that the first intermediate plate is situated between the cladding metal plate and the second intermediate plate and the second intermediate plate is situated between the first intermediate plate and the base metal plate, and then hot rolling the explosive bonded titanium clad steel plate.

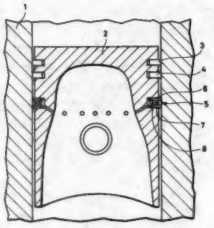
3. A titanium clad steel plate produced by a method comprising explosive bonding a cladding metal plate consisting of pure titanium having a titanium content of at least about 99.4% by weight, a first intermediate plate of a metal selected from tantalum, a tantalum alloy, niobium and a niobium alloy and a second intermediate plate of a metal selected from copper, a copper alloy, nickel and a nickel alloy, and a base metal plate consisting of carbon steel so that the first intermediate plate is situated between the cladding metal plate and the second intermediate plate and the second intermediate plate is situated between the first intermediate plate and the base metal plate, and then hot rolling the explosive bonded titanium clad steel plate.

4,612,260

PISTON RING MEMBER

Atsushi Kumagai; Tsutomu Tanabe, and Hirokazu Yasunaga, all of Shimane, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 638,939
Int. Cl.[4] F16J *9/26*
U.S. Cl. 428—667 **8 Claims**



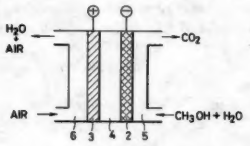
1. A piston ring member having improved wear resistance and scuffing resistance, said piston ring member being made of a martensite stainless steel consisting of from 0.4 to 0.7 wt % C, 0.3 to 1.0 wt % Si, 0.5 to 1.0 wt % Mn, and 2.0 to 9.0 wt % Cr, the balance being iron and impurities, and a surface-treated layer having a quench and temper hardness (H_RC) of 40 to 50 being formed on at least that part of said piston ring member which slides against a wall of a cylinder in which reciprocates a piston on which said piston ring member is mounted.

4,612,261

FUEL CELL BATTERY USING ACIDIC ELECTROLYTE

Tsutomu Tsukui, Hitachi; Toshio Shimizu, Katsuta, and Ryouta Doi, Naka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,603
Claims priority, application Japan, Aug. 21, 1981, 56-130316; Aug. 26, 1981, 56-132800
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—13 **23 Claims**



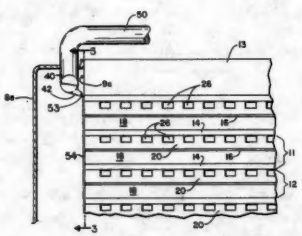
1. A fuel cell battery, using an acidic electrolyte in which the battery reaction is carried out at 100° C. or below, and adapted to utilize a liquid fuel and oxidant gas, comprising said acidic electrolyte, an oxidant electrode and fuel electrode on opposite sides of said acidic electrolyte, wherein upon electro-chemical reaction water is generated at the oxidant electrode and carbon dioxide is generated at the fuel electrode, and means for feeding a fuel to said fuel electrode and means for feeding an oxidant gas to said oxidant electrode, wherein said means for feeding an oxidant gas to said oxidant electrode includes means for controlling the flow rate Q_N of said oxidant gas to be fed to said oxidant electrode in a quantity sufficient to remove the water that is formed on said oxidant electrode by the electrochemical reaction between fuel and oxidant from said oxidant electrode, said flow rate being $Q_N=(6\text{–}20)\times10^{-0.370.5}\times I$ (l/min·cell), where T is a temperature of a gas at an outlet of the oxidant chamber and I is a battery current (A), and T is in the range of 20° C. to 80° C., whereby control of the flow rate of oxidant gas suplied to the oxidant electrode is used to remove said water that is formed on said oxidant electrode and provide optimal cell battery performance.

4,612,262

PROCESS FOR ADDING ELECTROLYTE TO A FUEL CELL STACK

Paul E. Grevstad, 78 Ridgewood Rd., West Hartford, Conn. 06107

Filed Aug. 6, 1984, Ser. No. 638,337
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—14 **6 Claims**



1. In a process for adding electrolyte to a fuel cell stack such that said stack has a desired operating volume and concentration of electrolyte therein, said stack comprising a plurality of elements defining a plurality of fuel cell units disposed one atop the other in abutting relationship, said units defining a substan-

tially flat, vertically extending external face, each unit including a cell comprising a pair of spaced apart gas porous electrodes with a porous matrix layer sandwiched therebetween for retaining electrolyte during cell operation, each unit also including a substantially non-porous separator, said separator being sandwiched between the cells of adjacent units, the steps of:

depositing dilute electrolyte of known concentration and from an external source directly onto said external face of the stack while it is in a non-operating mode, said deposited electrolyte being absorbed by capillary action into elements of said stack, said step of depositing continunig until all of said electrodes and matrix layers of said stack are fully saturated with the dilute electrolyte at substantially said known concentration; and

thereafter, while said stack is in a non-operating mode, evaporating water from said saturated elements under selected conditions of humidity and temperature until a steady state condition is reached, the steady state condition being a condition wherein said stack has said desired electrolyte volume and electrolyte concentration therein.

4,612,263

POWER CELL HAVING A GLASS SOLID ELECTROLYTE

M. Grayson Alexander, Windsor, and Brian Riley, Willimantic, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 1, 1985, Ser. No. 782,364

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—104 **8 Claims**

1. In a power cell having an anode, a cathode and a solid electrolyte, the improvement which comprises said solid electrolyte is a glass comprising from about 22 mole percent to about 47 mole percent Na_2O, from about 4 mole percent to about 9 mole percent Y_2O_3 and from about 47 mole percent to about 70 mole percent SiO_2.

4,612,264

BATTERY INITIATOR SYSTEM

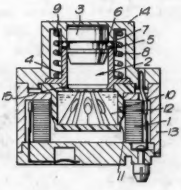
Raymond S. Fairwood, Blackburn, and Bryan J. Weal, Darwen, both of England, assignors to The Secretary of State in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 188,665, Sep. 19, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,428

Claims priority, application United Kingdom, Sep. 24, 1979, 7932971

Int. Cl.[4] H01M *6/30*

U.S. Cl. 429—114 **9 Claims**



1. A reserve battery initiator comprising an ampoule for containing an electrolyte, said ampoule having two portions conjoined by a mechanically weak section extending in a closed path, one portion being moveable relative to the other upon rupture of the weak section to release the electrolyte from the ampoule; a striker; means for mounting said striker for movement to impact with the said ampoule so as to rupture the ampoule at its mechanically weak section; and an insert within the ampoule, said insert being contiguous with the weak section along said closed path and with the area of impact of the striker, said insert being arranged to transmit a force imparted by the striker from the said area of impact directly to the immediate region of the weak section to fracture said weak section at each point along said closed path.

4,612,265

STABILIZATION OF SULFUR DIOXIDE SOLUTIONS CONTAINING LITHIUM PERCHLORATE AND A TETRAALKYLAMMONIUM PERCHLORATE

John F. Connolly, Glen Ellyn; Robert J. Thrash, Carol Stream, and Richard A. Kretchmer, Clarendon Hills, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 16, 1985, Ser. No. 776,599

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—196 **20 Claims**

1. A method for stabilizing a nonaqueous conductive liquid, said liquid comprising a solution of lithium perchlorate and at least one tetraalkylammonium perchlorate salt in liquid sulfur dioxide, which comprises adding to said liquid a minor amount of a stabilizer which consists of at least one material selected from the group consisting of iodine, bromine, chlorine, iodide salts, bromide salts and chloride salts, wherein said solution is substantially saturated in lithium perchlorate, the tetraalkylammonium perchlorate salt concentration is at least about 0.1 molal, and the amount of said stabilizer is effective to increase the stability of said liquid.

8. A nonaqueous conductive liquid which comprises a solution of lithium perchlorate, at least one tetraalkylammonium perchlorate salt and a stabilizer in liquid sulfur dioxide, wherein said stabilizer consists of at least one material selected from the group consisting of iodine, bromine, chlorine, iodide salts, bromide salts and chloride salts, and wherein said solution is substantially saturated in lithium perchlorate, the tetraalkylammonium perchlorate salt concentration is at least about 0.1 molal, and the amount of said stabilizer is in the range from about 5 ppm to about 5000 ppm.

15. An electrochemical cell comprising in combination:

(a) a lithium anode;

(b) a cathode; and

(c) a nonaqueous conductive liquid electrolyte which comprises a solution of lithium perchlorate, at least one tetraalkylammonium perchlorate salt and a stabilizer in liquid sulfur dioxide, wherein said stabilizer consists of at least one material selected from the group consisting of iodine, bromine, chlorine, iodide salts, bromide salts and chloride salts, and wherein said solution is substantially saturated in lithium perchlorate, the tetraalkylammonium perchlorate salt concentration is at least about 0.1 molal, and the amount of said stabilizer is in the range from about 5 ppm to about 5000 ppm.

4,612,266

ELECTROCHEMICAL CELL

Roger J. Bones, Abington, England; Roy C. Galloway; Johan Coetzer, both of Pretoria, South Africa, and David A. Teagle, Swindon, England, assignors to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg

Division of Ser. No. 631,905, Jul. 18, 1984, Pat. No. 4,560,627. This application Aug. 13, 1985, Ser. No. 765,122

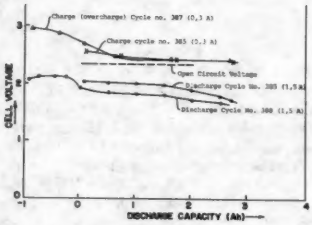
Claims priority, application United Kingdom, Jul. 22, 1983, 839749

Int. Cl.[4] H01M *4/36*

U.S. Cl. 429—221 **4 Claims**

1. A cathode for an electrochemical cell which cathode contains iron and comprises an electrolyte permeable matrix impregnated with a sodium aluminium halide molten salt electrolyte which contains chloride ions, the cathode containing, in contact with the electrolyte, a protective cathode substance

which oxidizes by chlorination at a voltage less than the open circuit voltage of the Fe/$FeCl_3$//Na plateau, and greater than


Charge (overcharge) Cycle no. 307 (0,3 A)
Charge cycle no. 305 (0,3 A)
Open Circuit Voltage
Discharge Cycle No. 305 (1,5 A)
Discharge Cycle No. 300 (1,5 A)
CELL VOLTAGE
DISCHARGE CAPACITY (Ah)

the open circuit voltage of the cathode in its fully charged state when coupled with a sodium anode.

4,612,267

PROCESS FOR PRODUCING STRUCTURES IN RESIST LAYERS USING ULTRASONIC IRRADIATION

Knut Heitmann; Martin Hoppe; Eckhard Schneider, all of Wetzlar, and Andreas Thaer, Leihgestern, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,188

Claims priority, application Fed. Rep. of Germany, May 21, 1984, 3418854

Int. Cl.⁴ G03F *7/00, 7/02, 7/26*

U.S. Cl. 430—3 **8 Claims**

1. A process for the production of structures in a resist layer, comprising the steps of:

(a) initiating a selected structure by incompletely exposing a resist layer to a first radiation with a pattern corresponding to the selected structure; and

(b) developing the structure by exposing the resist layer to ultrasonic irradiation;

wherein said developing step comprises scanning the resist layer in a grid-like manner with a finely directed ultrasonic beam.

4,612,268

METHOD OF FORMING PHOSPHOR PATTERN ON FLUORESCENT SCREEN FOR COLOR PICTURE TUBES WITH POLYMER COAGULENT

Kiyoshi Miura; Hiroshi Yokomizo; Osamu Sasaya, all of Mobara; Hajime Morishita, Ota, and Yoshifumi Tomita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 193,399, Oct. 2, 1980, abandoned. This application Jul. 8, 1985, Ser. No. 753,793

Claims priority, application Japan, Sep. 28, 1979, 54-123790

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—28 **20 Claims**

1. In a method of forming a fluorescent screen for a color picture tube comprising:

a first step of coating an inner panel face of a bulb of the color picture tube with a photosticky substance mainly containing a diazonium compound to form a layer of the compound:

a second step of exposing to light through a color selection electrode portions of said compound layer where a first color phosphor is to be adhered to as to render exposed portions of said compound sticky;

a third step of applying the first color phosphor on the surface of said compound layer;

a fourth step of removing surplus first color phosphor applied on unexposed portions of said compound layer;

a fifth step of conducting said second, third and fourth steps consecutively for the phosphor of second and third colors to form a fluorescent screen comprising picture elements of triads of three color phosphors on the inner face of the panel; and

a sixth step of filming or aluminizing said fluorescent screen;

the improvement wherein after applying the three color phosphors to the inner face of the panel and before said filming or aluminizing step, said said inner panel face with picture elements of three color phosphors is treated with an aqueous solution of polymer coagulant to improve the adhesiveness of the phosphor to the inner panel face thereby allowing sufficient washing to form a color picture tube having better quality and improved brightness.

8. A method of forming a fluorescent screen for a color picture tube comprising:

a first step of coating an inner panel face of the color picture tube with a photosticky substance mainly containing a diazonium compound to form a layer of the compound;

a second step of exposing to light through a color selection electrode portions of said compound layer where a first color phosphor is to be adhered so as to render exposed portions of said compound sticky;

a third step of applying the first color phosphor on the surface of said compound layer;

a fourth step of removing surplus first color phosphor applied on unexposed portions of said compound layer;

a fifth step of conducting said second, third, fourth steps consecutively for the phosphor of second and third colors to form a fluorescent screen comprising picture elements of triads of three color phosphors on the inner face of the panel; and

a sixth step of filming or aluminizing said fluorescent screen;

the improvement wherein after applying the three color phosphors to the inner face of the panel and before said filming or aluminizing step, said inner panel face with picture elements of triads of three color phosphors is treated with an aqueous solution containing polymer coagulant and surfactant, thereby improving the quality and brightness of the fluorescent screen after filming.

4,612,269

METHOD OF FABRICATING A LITHOGRAPHIC MASTER

Virgil W. Westdale, Barrington, and James L. Hanrahan, Mt. Prospect, both of Ill., assignors to AM International, Chicago, Ill.

Filed Mar. 29, 1985, Ser. No. 717,656

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 430—49 **9 Claims**

1. A process of preparing a lithographic printing master which comprises:

forming an electrostatic latent image on the surface of an electrophotographic lithographic member;

developing said latent image with a developer composition consisting essentially of a polyamide resin consisting of from 65–75 percent of a low melt viscosity polyamide resin having a melting point within the range of from about 70° to 165° C. and from 35–25 percent of a polyamide-rosin component, and a magnetic oxide in an amount ranging from 35–50 parts resin composition to 65–60 parts of said magnetic oxide, said developer material having the capacity to develop an electrostatic latent image which is pressure fixable; and

pressure fixing said developed image to said member.

4,612,270

TWO-LAYER NEGATIVE RESIST

Thomas R. Pampalone, Mendham Township, Morris County, and Paula M. Holder, Franklin Park, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 14, 1985, Ser. No. 711,720

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—273 **19 Claims**

1. A medium for lithographic recording comprising a sub-

strate having on a surface thereof a first layer comprising a negative-working resist and a second layer consisting essentially of a polyfunctional acrylate or methacrylate monomer.

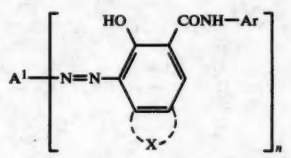
4,612,271

PHOTOSENSITIVE COMPOSITION COMPRISING AZO COMPOUNDS

Naonori Makino; Seiji Horie, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1985, Ser. No. 811,134
Claims priority, application Japan, Dec. 21, 1984, 59-270310; Apr. 15, 1985, 60-80025
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—72 10 Claims

1. A photosensitive composition comprising at least one azo compound represented by formula (1)



(1)

wherein A^1 represents a substituted or unsubstituted carbocyclic or heterocyclic aromatic ring; X represents an atomic group forming a substituted or unsubstituted carbocyclic or heterocyclic aromatic ring upon condensation with benzene rings; Ar represents a carbocyclic or heterocyclic aromatic ring substituted by at least one perfluoroalkyl group; and n represents an integer of 3, 4, 5, or 6.

4,612,272

PRESSURE FIXING A SINGLE COMPONENT TONER WITH POLYAMIDE-ROSIN

Virgil W. Westdale, Barrington, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Mar. 29, 1985, Ser. No. 717,561
Int. Cl.[4] G03G *13/20*
U.S. Cl. 430—98 3 Claims

1. An electrophotographic imaging process comprising:
forming an electrostatic latent image on the surface of a photoconductive insulating layer,
developing said latent image with a single component pressure fusible developer composition consisting essentially of a polyamide resin composition consisting of from 65–75 percent of a low melt viscosity polyamide resin component having a melting point within the range of from about 70° to 165° C. and from 35–25 percent of a polyamide-rosin component, and a magnetic oxide component, said polyamide resin composition being present in an amount of from 35 to 50 percent of said developer and said magnetic oxide component being present in an amount of from 65–50 percent of said developer, said developer having the capacity to develop an electrostatic latent image to form a toner image which is pressure fixable in the absence of heat, and
pressure fusing said toner in an imagewise configuration to said photoconductive insulating layer in the absence of heat.

4,612,273

PRESSURE FIXING A SINGLE COMPONENT TONER WITH POLYAMIDE-ROSIN

Virgil W. Westdale, Barrington, and James L. Hanrahan, Mt. Prospect, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Mar. 29, 1985, Ser. No. 717,657
Int. Cl.[4] G03G *13/20*
U.S. Cl. 430—98 3 Claims

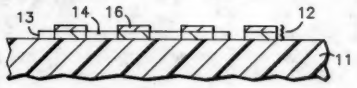
1. An electrophotographic imaging process comprising:
forming an electrostatic latent image on the surface of a photoconductive insulating layer,
developing said latent image with a single component toner composition consisting essentially of a polyamide resin composition consisting of from 65–75 percent of a low melt viscosity polyamide resin having a melting point within the range of from about 70° to 165° C. and from 35–25 percent of a polyamide-rosin component, and a magnetic oxide component, said polyamide resin composition being present in an amount of from 35 to 50 percent of said developer and said magnetic oxide component being present in an amount of from 65–50 percent of said developer, said developer having a particle size of from 10–40 microns with the capacity to develop an electrostatic latent image to form a toner image which is pressure fixable in the absence of heat, and
pressure fusing said toner in an imagewise configuration to said photoconductive insulating layer in the absence of heat.

4,612,274

ELECTRON BEAM/OPTICAL HYBRID LITHOGRAPHIC RESIST PROCESS IN ACOUSTIC WAVE DEVICES

Frederick Y. Cho, Scottsdale; John R. Joseph, Fountain Hills, and Philip A. Seese, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 18, 1985, Ser. No. 799,366
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—296 5 Claims



1. A hybrid process of electron beam and optical lithography for making acoustic wave devices comprising the steps of:
providing a substrate;
placing a layer of Aluminum on said substrate;
placing a layer of positive photoresist on said layer of Aluminum;
exposing a portion of said positive photoresist with an electron beam delineating a fine line of one micron or less;
developing said positive photoresist removing said exposed portion of said positive photoresist causing a first portion of said Aluminum layer to be exposed;
placing a layer of Titanium over the surface of a remaining portion of said positive photoresist and the exposed surface of said Aluminum;
removing said remaining portion of said positive photoresist causing the Titanium disposed on the surface of said positive photoresist to be removed and exposing a second portion of said Aluminum;
placing a layer of a second photoresist over said second portion of said Aluminum and over a remaining portion of said Titanium;
masking a portion of said second photoresist designating a pad area;
exposing said second photoresist using an optical lithographic technique;

developing said second photoresist causing a remaining portion of said second photoresist to be removed;

etching said Aluminum causing a portion of said Aluminum to be removed from said acoustic wave device, leaving a portion of said Aluminum disposed below said portion of said second photoresist and a portion of said Aluminum disposed below said remaining portion of said Titanium; and

removing said portion of said second photoresist.

4,612,275

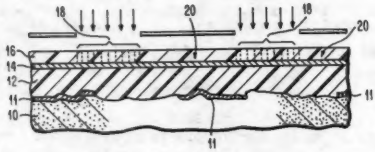
MULTILAYER RESISTS WITH IMPROVED SENSITIVITY AND REDUCED PROXIMITY EFFECT

Lawrence V. Gregor, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1985, Ser. No. 727,469

Int. Cl.[4] G03C 1/78

U.S. Cl. 430—296 **15 Claims**



1. A multi-layer resist structure for use in the production of micrometer and submicrometer geometries in electronic substrates, comprising one or more layers, at least one of which is a metallic layer and least one of which is a radiation-sensitive polymeric material, wherein said metallic layer is selected from the group consisting of tantalum, tungsten, rhenium, osmium, iridium, platinum, gold, and alloys of a metal within said group, and wherein said metallic layer is disposed between said radiation-sensitive polymeric material and said electronic substrate, so that it can be used to control reflection and backscatter of radiation used to create a latent image within said radiation-sensitive polymeric material.

4,612,276

METHOD OF FORMING LITHOGRAPHIC PRINT PLATE UTILIZING WATER DEVELOPMENT OF AN IMAGED BI-LAYER NEGATIVE-WORKING DIAZONIUM MATERIAL

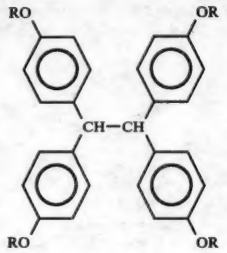
Alan R. Browne, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 636,419, Jul. 31, 1984. This application May 13, 1985, Ser. No. 718,670

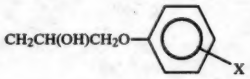
Int. Cl.[4] G03F 7/08, 7/10

U.S. Cl. 430—302 **1 Claim**

1. The method of forming a lithographic printing plate which comprises first coating a substrate having a hydrophilic surface with a layer of a water-soluble, lithographically suitable, photosensitive, negative-working composition of a polymeric diazonium condensation product, top coating said composition with a layer consisting of a water-permeable, water-insoluble, oleophilic reaction product of an O-epoxy-alkylated tetrakis (hydroxyphenyl) ethane resin and a substituted or unsubstituted phenol of the formula:



wherein R is



and X is H, halogen, alkoxy containing 1 to 8 carbon atoms, alkyl containing 1 to 14 carbon atoms, aryl containing 6 to 14 carbon atoms and aralkyl containing 6 to 14 carbon atoms, exposing said coatings imagewise to UV radiation and, thereafter, developing said plate by removing the unexposed areas of the layers solely with water.

4,612,277

IMAGE-RECEIVING ELEMENT FOR SILVER SALT DIFFUSION PROCESS WITH IMAGE STABILIZER PRECURSOR

Yoshio Inagaki, and Katsusuke Endo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1984, Ser. No. 629,851

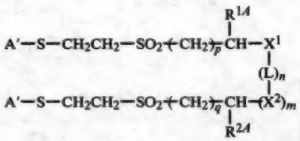
Claims priority, application Japan, Jul. 11, 1983, 58-125645

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] G03C 5/54, 1/02

U.S. Cl. 430—233 **28 Claims**

1. An image-receiving element for a silver salt diffusion transfer process, said element comprising an image stabilizing agent precursor having an inactive group capable of being removed upon contact with an alkaline processing composition, and substantially lacking an image-stabilizing function prior to contact with the alkaline processing composition, said image stabilizing agent precursor being represented by general formula (III):



wherein A' represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a 5- or 6-membered nitrogen-containing heterocyclic ring; $R^{1,4}$ and $R^{2,4}$ may be the same or different and each represents hydrogen or an alkyl group having 1 to 4 carbon atoms; p and q are each 0 or an integer of 1 to 3 and may be the same or different; X^1 and X^2 may be the same or different, and each represents an ester linkage, a substituted or unsubstituted amido linkage, or an ether linkage and L represents an alkylene group, a phenylene group or a xylylene group; and n and m are each 0 or 1, provided that when X^1 and X^2 are amido groups, substituents

on the nitrogen may be linked to each other to form a hetero ring together with L and a part of each of X^1 and X^2.

4,612,278

PHOTOGRAPHIC MATERIALS AND PROCESS COMPRISING POLYMERIC COUPLERS WITH ALKOXYALKYLACRYLATE COMONOMERS

Philip Lau, and Ping W. Tang, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1985, Ser. No. 756,138
Int. Cl.[4] G03C *1/40, 7/32*
U.S. Cl. 430—381 **23 Claims**

15. A process of forming a photographic image which comprises developing an exposed silver halide emulsion layer with a color developing agent in the presence of a polymeric coupler wherein the polymeric coupler is at least a copolymer comprising a repeating unit comprising a coupler moiety and at least one repeating unit derived from a monomer which is an alkoxyalkylacrylate containing no coupler moiety wherein the alkoxyalkyl moiety is unsubstituted.

4,612,279

PROTECTIVE OVERCOAT FOR PHOTOGRAPHIC ELEMENTS

David J. Steklenski, Rochester, and Philip L. Keogh, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 22, 1985, Ser. No. 757,701
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—523 **4 Claims**

1. A photographic element comprising a support having on one side thereof a radiation-sensitive silver halide layer and on the other side thereof, an antistatic layer and as the outermost layer, a layer comprising a polymer blend comprising cellulose nitrate and a polymer characterized in that (a) the polymer comprises at least 70 weight percent of polymerized recurring units derived from a hydrophobic monomer selected from the group consisting of styrene, alkyl acrylates and alkyl methacrylates and 10 to 24 weight percent of polymerized recurring units derived from an acid monomer selected from the group consisting of methacrylic acid and acrylic acid; and (b) the blend comprises from 20 to 70 weight percent of cellulose nitrate and from 8 to 15 weight percent of the polymerized recurring acid monomer.

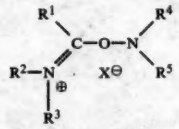
4,612,280

HARDENED GELATIN AND METHOD FOR HARDENING GELATIN

Hisashi Okamura, and Hiroshi Kawamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1985, Ser. No. 789,810
Claims priority, application Japan, Oct. 24, 1984, 59-223457
Int. Cl.[4] C09H *7/00;* **G03C** *1/30*
U.S. Cl. 430—621 **23 Claims**

1. A hardened gelatin that has been hardened with at least one compound represented by formula (I)

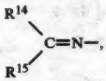


(I)

wherein

R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, a group $R^{11}O$—, a group

a group



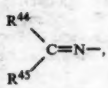
or a group $R^{16}S$—, wherein R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, and R^{16} each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted alkenyl group; or R^{14} and R^{15} each represents hydrogen atoms, or R^{12} and R^{13} or R^{14} and R^{15} combine together to form a ring structure or R^1 together with R^2 forms a nitrogen-containing heterocyclic ring, or the thus formed ring is further condensed with another ring;

R^2 and R^3 each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted alkenyl group, or combine together to form a nitrogen-containing heterocyclic ring;

R^4 and R^5 each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, a group

a group R^{42}—SO_2—, or a group R^{43}—N=N—, or R^4 and R^5 share the same carbon atom such that the group

takes a form of



or R^4 and R^5 combine together to form a nitrogen-containing heterocyclic ring, or the thus formed ring is further condensed with another ring;

R^{41}, R^{42}, R^{43}, R^{44}, and R^{45} each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted alkenyl group; or R^{44} and R^{45} each represents a hydrogen atom or combine together to form a ring; and

$X^{\ominus}$ represents an anion or combines together with another part of the compound of formula (I) to form an intramolecular salt.

4,612,281

IMMUNOASSAY FOR DETECTING IMMUNOGLOBULINS AND TEST KIT

Georges Desmonts, Paris, France, and Jack S. Remington, Menlo Park, Calif., assignors to Palo Alto Medical Foundation Research Institute, Palo Alto, Calif.

Continuation-in-part of Ser. No. 212,535, Dec. 3, 1980, abandoned. This application Nov. 5, 1982, Ser. No. 439,433
Int. Cl.[4] G01N *33/53, 33/569*
U.S. Cl. 435—7 22 Claims

1. An immunoassay for detecting in a sample of body fluid an Ig that binds specifically to an antigen associated with a microorganism comprising the steps of:

(a) adsorbing an antibody against said Ig onto the solid surface of a well-shaped container;

(b) applying the sample to the adsorbed antibody against said Ig and incubating the resulting mixture;

(c) separating the nonadsorbed fraction from the adsorbed fraction of the incubated mixture of step (b);

(d) applying the microorganism as constituting an insoluble, opaque, directly observable form of the antigen to the adsorbed fraction; and

(e) observing directly the extent to which the insoluble opaque antigen is bound to the adsorbed fraction by observing the distribution of the antigen on the wall of the container.

4,612,282

MONOCLONAL ANTIBODIES REACTIVE WITH HUMAN BREAST CANCER

Jeffrey Schlom; David Colcher, both of Vienna, Va.; Marianna Nuti, Bethesda, Md.; Patricia H. Hand, Washington, D.C., and Faye Austin, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 330,959, Dec. 15, 1981, Pat. No. 4,522,918. This application Mar. 1, 1985, Ser. No. 707,400
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] C12P *21/00;* C12N *15/00, 5/00;* G01N *33/54*
U.S. Cl. 435—68 6 Claims

1. Antibodies from hybridoma cultures produced by the steps of

(1) taking splenic lymphocytes of mice previously immunized with membrane-enriched fractions of immunoglobulin-depleted cancer cells;

(2) fusing the lymphocytes with a myeloma cell line, and

(3) culturing the hybridoma cell line in an in vitro culture medium or in vivo therefor to produce antibodies, which antibodies are selected from one member of the group consisting B6.2, B14.2, B39.1, F64.5,B25.2, B84.1, B38.1, B50.4 and B50.1 and which

(a) react and bind with extracts from human metastatic mammary carcinoma cells from involved livers but not with liver cell extracts;

(b) react and bind with at least one of the mammary carcinoma cell lines, BT-20, MCF-7, ZR-75-1, but not with lung, vulva epidermoid or oral epidermoid and not with rhabdomyosarcoma, fibrosarcoma and melanoma; and

(c) do not react with normal cell derived from breast, skin, lung, bone marrow, kidney, spleen and uterus.

4,612,283

METHOD FOR PURIFICATION OF HBS ANTIGEN

Keishin Sugahara; Chikateru Nozaki; Fukusaburo Hamada; Fumio Miake, and Nobuya Ohtomo, all of Kumamoto, Japan, assignors to 501 Juridical Foundation, The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Oct. 1, 1984, Ser. No. 656,315
Claims priority, application Japan, Oct. 5, 1983, 58-186187
Int. Cl.[4] C12P *21/00;* A61K *39/29*
U.S. Cl. 435—68 14 Claims

1. A method for purification of HBs antigen, which comprises treating an HBs antigen-containing material with an acid to adjust the pH value to a range of 5 to 6, removing the resulting precipitates, and subjecting the HBs antigen-containing solution to a chromatography with hydroxyapatite.

4,612,284

PROCESS FOR THE ENZYMATIC HYDROLYSIS OF NON-GELATINIZED GRANULAR STARCH MATERIAL DIRECTLY TO GLUCOSE

Carl E. Pickens, Decatur, and Carl W. Niekamp, Forsyth, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 28, 1984, Ser. No. 656,117
Int. Cl.[4] C12P *19/20, 19/02*
U.S. Cl. 435—96 13 Claims

1. A process for the hydrolysis of a non-gelatinized granular starch material comprising the steps of:

(a) partially hydrolyzing a non-gelatinized granular starch slurry at a temperature which is from about 50° to about 65° C. and which is less than the gelatinization temperature of said granular starch material in a treatment (1) in which said starch slurry is contacted with an enzyme system capable of hydrolyzing starch in non-gelatinized granular form directly to glucose, said enzyme being employed in an amount which, under the specific hydrolysis temperature and time employed, is sufficient to hydrolyze at least a substantial proportion of said non-gelatinized granular starch material to glucose but is insufficient to hydrolyze all of said starch material, and (2) in which fat and/or protein is liberated from the hydrolyzed starch material during said treatment and wherein said fat and/or protein is adsorbed or deposited upon, or otherwise becomes associated with, non-gelatinized starch granules remaining substantially non-hydrolyzed therein; and

(b) thereafter separating the non-hydrolyzed granular starch material having fat and/or protein adsorbed or deposited thereon or otherwise associated therewith from the glucose product resulting from the starch hydrolysis accomplished in step (a) and recovering said glucose product.

4,612,285

NOVEL ANTITUMOR ANTIBIOTIC AWAMYCIN AND ITS PRODUCTION

Iwao Umezawa, Tokyo, and Kanki Komiyama, Kanagawa, both of Japan, assignors to Kitasato Institute, Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,369
Claims priority, application Japan, Nov. 26, 1982, 57-206087
Int. Cl.[4] C12P *13/00;* C12R *1/465;* A61K *35/00;* C07G *11/00*
U.S. Cl. 435—128 2 Claims

1. An antibiotic awamycin having the following physicochemical properties;

(1) Elementary analysis:
comprising corbon, hydrogen, oxygen and nitrogen,
C: 59.16%, H: 6.48%, N: 1.88%

(2) Molecular weight: 744±1 (mass spectrum analysis),

(3) Melting point: 158° C.,

(4) Optical rotation: $[\alpha]_D^{24} = +836°$ (c=0.1, chloroform),

(5) Ultraviolet absorption spectrum: shown in FIG. 1,

(6) Infrared absorption spectrum: shown in FIG. 2,

(7) Solubility:
insoluble in hexane and petroleum ether, difficultly soluble in water and diethyl ether, and
soluble in methanol, ethanol, dichloromethane, chloroform, acetone, ethyl acetate, benzene and dimethylformamide,

(8) Color reactions:
positive for alkaline quinine reaction (violet) and magnesium acetate reaction (red purple),
negative for Molisch and ninhydrin reaction,

(9) Nature: acidic substance, and

(10) Color: orange colored powder.

4,612,286
ACID HYDROLYSIS OF BIOMASS FOR ALCOHOL PRODUCTION

Michael I. Sherman, and Carl L. Elmore, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

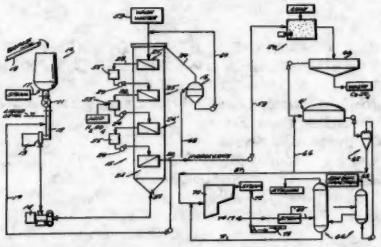
Continuation-in-part of Ser. No. 335,517, Dec. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 122,270, Feb. 19, 1980, abandoned. This application Jul. 23, 1984, Ser. No. 633,350

Claims priority, application Canada, Feb. 13, 1981, 370908

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] C12P *7/04;* **C13K** *1/02;* **C02F** *3/00;* **D21C** *11/00*

U.S. Cl. 435—157 **20 Claims**



1. A method of producing fuel alcohol from biomass containing carbohydrate and lignin, comprising the steps of:

(a) particlizing and slurrying the biomass;

(b) continuously subjecting the biomass to acid hydrolysis at temperature, acid concentration, and residence time conditions sufficient to effect hydrolysis of the hemicellulose in the biomass to effect separation of pentose and hexose sugars therefrom into a hydrolysate having insufficient furfural to substantially inhibit fermentation microorganisms growth, while not substantially hydrolyzing the cellulose in said biomass by: establishing a flow of the slurried biomass in a first direction in a vessel; contacting the flowing slurry with a plurality of concentric non-rotatable screen members each having an apertured face and having a conduit leading away from the face to an area remote from said flow; introducing dilute acid into the slurry flow through a plurality of rotatable spray tubes extending parallel to the direction of said slurry and disposed between said screen members in a direction perpendicular to the direction of flow; removing hydrolysate from the flow by withdrawing liquid through the screen members and passing it through the conduit; and moving the screen members alternately generally in said direction of slurry flow and in a direction opposite said direction of slurry flow;

(c) effecting fermentation of the pentose and hexose sugars in said hydrolysate; and

(d) producing fuel alcohol from the fermented pentose and hexose sugars.

4,612,287
PLASMIDS CONTAINING A GENE CODING FOR A THERMOSTABLE PULLULANASE AND PULLULANASE-PRODUCING STRAINS OF *ESCHERICHIA COLI* AND *BACILLUS SUBTILIS* CONTAINING THE PLASMIDS

Robert D. Coleman, Lisle, and Michael P. McAlister, Willowbrook, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 23, 1985, Ser. No. 737,312

Int. Cl.[4] C12N *15/00, 9/44, 1/20;* **C12R** *1/125, 1/19*

U.S. Cl. 435—172.3 **7 Claims**

1. An essentially pure plasmid, having a genetic sequence coding for a thermostable pullulanase enzyme, selected from the group: pCPC901, having a molecular weight of approximately 15.3 kb and a restriction endonuclease cleavage map as shown in FIG. 1; pCPC902, having a molecular weight of approximately 9.9 kb and a restriction endonuclease cleavage map as shown in FIG. 2; and pCPC903, having a molecular weight of approximately 7.5 kb and a restriction endonuclease cleavage map as shown in FIG. 3.

4,612,288
OXIRANE RESINS FOR ENZYME IMMOBILIZATION

Michael P. Bigwood, Oreland, and John O. Naples, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 561,716, Dec. 15, 1983, Pat. No. 4,582,860. This application Jan. 13, 1986, Ser. No. 818,518

Int. Cl.[4] C12N *11/08*

U.S. Cl. 435—180 **2 Claims**

1. An oxirane-group-bearing porous carrier bead for immobilized enzymes upon which an enzyme has been immobolized by chemically attaching the hydrogen bearing group or the proteinaceous portion of the enzyme to the porous carrier at the site of the oxirane group, the porous carrier being prepared by free-radical, suspension polymerizing an oxirane-group-bearing monovinyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, allyl glycidyl ether, and mixtures thereof, and a trivinyl crosslinking monomer having hydrophilic character, the ratio of monovinyl monomer to trivinyl monomer being from about 5:95 to about 50:50 by weight, in the presence of about 20% to about 90%, based on the weight of the organic phase, of a phase separator which does not react with the oxirane group, in an aqueous suspension medium.

4,612,289
METHOD FOR ANALYZING LIQUID SAMPLE

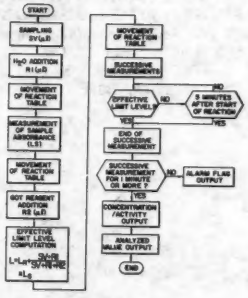
Yoshiteru Furuta, Katsuta, and Yasushi Nomura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,033

Claims priority, application Japan, Nov. 10, 1980, 55-158665

Int. Cl.[4] G01N *21/78, 33/50*

U.S. Cl. 436—34 **9 Claims**



1. A method for analyzing a liquid sample by rate analysis quantitatively determining an analytical item contained in the sample, which comprises a step of adding a reagent to a sample to obtain a resultant liquid sample, a step of positioning the resultant liquid sample to a first location of measuring a physical quantity of the liquid sample, a step of effecting a first measurement of the light intensity of the liquid sample positioned at the first location, a step of mixing the liquid sample with a second reagent capable of initiating reaction for quantitative determination of desired analytical item, a step of positioning the resulting reaction-initiated liquid mixture to a second position of measuring the light intensity of the liquid

mixture, a step of effecting second measurements of the light intensity of the liquid mixture positioned at the second location in a plurality of repetitions for a predetermined time, thereby determining the rate of reaction initiated by the second reagent, a step of calculating an absorbance level value (L_s) based on the value of the first measurement (L_m) and a absorbance level value (L_b) based only on the first reagent determined in advance, a step of calculating an effective limit level (L) corresponding to the absorbance level value (L_s) and an absorbance level value (L_r) based only on the second reagent determined in advance, a step of discarding any second measurement values obtained after a set effective limit level is reached within said predetermined time, and a step of computing an analysis value of said desired analytical item according to light intensity values of the second measurement step obtained before the effective limit level value is reached.

4,612,290

METHOD OF BILIRUBIN DETECTION

Kenichiro Yazawa; Osamu Seshimoto; Masao Kitajima, and Asaji Kondo, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 294,278, Aug. 19, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 542,569

Claims priority, application Japan, Aug. 19, 1980, 55-112998

Int. Cl.⁴ G01N *33/72*

U.S. Cl. 436—97 **8 Claims**

1. A method for quantitatively determining the bilirubin content within an aqueous sample, comprising the steps of:

bringing a bilirubin-containing aqueous liquid sample into contact with a hydrophobic bilirubin extracting composition comprising a hydrophobic oil-soluble primary, secondary or tertiary amine capable of extracting bilirubin and an extraction aid, said bilirubin extracting composition being hydrophobic to such an extent that it forms at least an emulsion when it is dispersed in neutral water;

extracting the bilirubin in said aqueous sample with said bilirubin extracting composition; and

determining, by photometry, the concentration of bilirubin extracted with said bilirubin extracting composition.

4,612,291

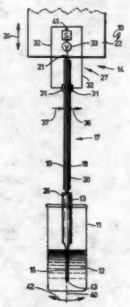
METHOD AND APPARATUS FOR MIXING SERUM AND REAGENTS FOR CHEMICAL ANALYSIS

Dennis K. Dawes, Indianapolis, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed Sep. 4, 1984, Ser. No. 646,812

Int. Cl.⁴ B01F *11/00, 15/02*

U.S. Cl. 436—174 **12 Claims**



1. A method for mixing a serum sample and one or more reagents for chemical analysis comprising

providing a container containing a serum sample and one or more reagents to be mixed;

providing a mixing apparatus for mixing said serum sample and said one or more reagents in said container, said mixing apparatus including an assembly comprising a thin, flexible plate having first and second piezoelectric elements attached to opposite faces thereof and having a mixing member attached to one end of said assembly;

positioning said mixing member within said container with at least a portion of said mixing member extending into said serum sample and one or more reagents contained therein; and

applying a voltage across said first and second piezoelectric elements for causing said one end of said assembly and said mixing member attached thereto to oscillate back and forth over a generally arcuate path to mix said serum sample and one or more reagents within said container.

4,612,292

LEAD/ALKALINE EARTH METAL SILICATES AND VITRESCIBLE COMPOSITIONS COMPRISED THEREOF

Christian Richard, Clamecy, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 125,212, Feb. 27, 1980, abandoned, which is a continuation of Ser. No. 123,849, Feb. 22, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 456,814

Claims priority, application France, Feb. 22, 1979, 79 04536; Jun. 6, 1979, 79 14408; Sep. 18, 1979, 79 23176

Int. Cl.⁴ C03C *3/102*

U.S. Cl. 501—27 **18 Claims**

1. A process for the preparation of glass, comprising melting, fining in the absence of any fining aid and shaping into glass a glass-forming composition comprising an amorphous SiO_2/MeO metallic silicate, said metal Me being selected from the group consisting of lead, calcium, barium and zinc, said silicate being essentially devoid of metallic impurities and comprising the oxides SiO_2 and MeO in a molar ratio SiO_2/MeO of greater than 2, said metallic silicate being prepared according to the method comprising reacting an aqueous solution of an alkali metal silicate with an aqueous solution of a water soluble Me salt, the alkali metal oxide comprising the alkali metal silicate substituted by an Me oxide, the molar ratio of SiO_2 to MeO in the reaction product corresponding to the molar ratio of SiO_2 to alkali metal oxide in the starting material alkali metal silicate, and recovering and drying said metallic silicate.

4. The process of claim 1 wherein the molar ratio of SiO_2/MeO is between 3 and 5.

18. The process of claim 1 wherein said oxides SiO_2 and MeO are present in a molar ratio SiO_2/MeO of greater than 3.

4,612,293

UPGRADING OF SPENT BUTANE ISOMERIZATION CATALYST TO PENTANE ISOMERIZATION CATALYST

Marvin M. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1985, Ser. No. 781,079

Int. Cl.⁴ B01J *27/12*

U.S. Cl. 502—28 **9 Claims**

1. A process for converting a chloride-containing platinum on alumina support isomerization catalyst to a fluoride-containing platinum on alumina support isomerization catalyst which comprises:

(a) washing said chloride-containing catalyst with wash medium under conditions suitable to remove substantially all chloride ions;

(b) treating the product of (a) with at least one aqueous fluorinating agent under conditions suitable to provide intimate contact between said alumina support and said fluorinating agent; and

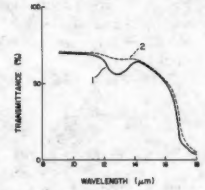
(c) drying the product of (b) under conditions suitable to produce a substantially water-free fluoride-containing platinum on alumina support isomerization catalyst.

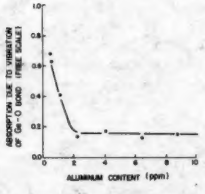
4,612,294

GLASS MATERIAL FOR OPTICAL FIBERS USED IN INFRARED REGION

Toshio Katsuyama, Hachioji; Shin Satoh, Iruma, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,769
Claims priority, application Japan, Nov. 28, 1983, 58-222073
Int. Cl.[4] C03C 3/32
U.S. Cl. 501—40 11 Claims





1. An infrared-transmitting glass material for use as optical fibers used in infrared region, which is a selenium-base chalcogenide glass selected from the group consisting of selenium-germanium glass, selenium-antimony-germanium glass and selenium arsenic-germanium glass in which from 2 ppm to 100 ppm of at least one of aluminum, gallium and indium is incorporated, wherein said glass exhibits a substantial decrease in absorption loss due to Ge—O bond over the same glass absent said incorporation of a least one of aluminum, gallium and indium.

11. The glass material according to claim 1, wherein the selenium-base chalcogenide glass is selenium-germanium glass in which the molar ratio of Ge:Se is 20:80.

4,612,295

GLASS FOR EYE GLASS LENS

Hiroji Sagara, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,224
Claims priority, application Japan, Jul. 14, 1983, 58-126908
Int. Cl.[4] C03C 4/00, 3/064, 3/068, 3/155
U.S. Cl. 501—51 2 Claims

1. A glass for an eye glass lens having a refractive index of 1.79 or more, an Abbe number of 32 to 38 and a specific gravity of less than 3.6, consists essentially of, in % by weight,

22 to 36% $SiO_2+B_2O_3$;
0 to 36% SiO_2;
0 to 36% B_2O_3;
16 to 42% CaO+MgO;
8 to 42% CaO;
0 to 22% MgO;
14 to 36% $TiO_2+Nb_2O_5$;
0 to 19% TiO_2;
1 to 35% Nb_2O_5;
0 to 13% ZrO_2;
0 to 14% La_2O_3;
0 to 17% Y_2O_3;
0 to 10% Gd_2O_3;
0 to 10% Ta_2O_5;
0 to 12% WO_3;
0 to less than 5% $Li_2O+Na_2O+K_2O$;
0 to 14% BaO;
0 to 16% SrO;
0 to 14% ZnO;
0 to 14% Al_2O_3; and
0 to 10% P_2O_5,

wherein the total amount of the trivalent or more oxides at least $1.05\times(SiO_2+B_2O_3+Al_2O_3+P_2O_5+$alkali metal oxides).

4,612,296

HIGH TOUGHNESS SILICON NITRIDE SINTERED BODY AND PROCESS FOR PRODUCING THE SAME

Hiroshi Sakamoto, and Tadahiko Miyoshi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,339
Claims priority, application Japan, Aug. 22, 1984, 59-173289
Int. Cl.[4] C04B 35/02
U.S. Cl. 501—93 4 Claims

1. A high toughness silicon nitride sintered body, characterized in that said sintered body comprises silicon nitride as a main component and at least one member selected from the group consisting of silicides and carbides in the form of plate particles, of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W, the thickness of plate of said plate particles being 1/5 or below of the shorter diameter of principal plane of plate of the plate particles.

4,612,297

PROCESS FOR PREPARATION OF SILICON NITRIDE POWDER OF GOOD SINTERING PROPERTY

Kiyoshi Kasai; Takaaki Tsukidate, both of Shinnanyo; Shinji Nagata, Ibaraki, and Toshihiko Arakawa, Shinnanyo, all of Japan, assignors to Toya Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,884
Claims priority, application Japan, Dec. 8, 1982, 57-213995
Int. Cl.[4] C04B 35/58
U.S. Cl. 501—97 5 Claims

1. A process for the preparation of a silicon nitride powder having an enhanced sintering activity, which comprises heating D in a non-oxidizing atmosphere a mixture of an amorphous nitrogen-containing silane compound having a specific surface area of 100 to 1,000 m^2/g and from 3 to 17% by weight, based on the weight of the mixture, of a sintering aid selected from the group consisting of Y_2O_3, Al_2O_3,MgO, $Y_2(CO)_3$, $Al_2(CO_3)_3$, $MgCO_3$, Y oxalate, Al oxalate, Mg oxalate and AlN, wherein heating is at a temperature of 1,400° to 1,700° C. in an atmosphere composed mainly of nitrogen or at a temperature of 1,200° to 1,350° C. in vacuum or in an atmosphere composed mainly of at least one gas selected from the groups consisting of hydrogen and argon.

4,612,298

CARBO-METALLIC OIL CONVERSION CATALYSTS

William P. Hettinger, Jr., and Hubert W. Beck, both of Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 328,353, Dec. 7, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,484
Int. Cl.[4] B01J 29/06
U.S. Cl. 502—65 44 Claims

30. A method for preparing a catalyst comprising a calcined rare earth exchanged "Y" crystalline zeolite provided with a lanthanum to cerium ratio of at least 1, which method comprises:

(a) which method comprises: of micro-size kaolinite clay particles;
(b) preparing a liquid slurry comprising a lanthanum-rich "Y" crystalline zeolite of less than 0.47 wt % residual sodium obtained by one or more treatments, each comprising the sequence of exchange with rare earth metals and calcination;
(c) mixing said slurry of clay particles with a slurry of colloi-

dal silica to form a first slurry mixture comprising less than about 0.05 wt % Na20;

(d) mixing said slurry of crystalline zeolite with said first slurry mixture homogenized second slurry mixture at a pH avoiding gelling thereof;

(e) spray drying said second slurry mixture after homogenization to form microspherical catayist particles comprising about 10 to 50 wt % silica, about 5 to 50 wt % clay, and about 15 to 85 wt % of said lanthanum-rich "Y" crystalline zeolite; and

(f) recovering said microspherical particles.

4,612,299

MAGNESIUM CARBOXYLATE SUPPORTS

Gregory G. Arzoumanidis; Habet M. Khelghatian, both of Naperville, and Sam S. Lee, Hoffman Estates, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 629,106, Jul. 9, 1984, abandoned, and a continuation-in-part of Ser. No. 592,910, Mar. 23, 1984, Pat. No. 4,590,679. This application Jun. 6, 1985, Ser. No. 741,858

Int. Cl.[4] C08F *4/02, 4/64*

U.S. Cl. 502—104 **18 Claims**

1. A process of preparing a composition comprising a transition metal component and a magnesium carboxylate support which comprises the steps of reacting a solution of a hydrocarbyl magnesium compound with sufficient carbon dioxide to form a magnesium carboxylate precipitate and reacting said magnesium carboxylate with a transition metal component wherein said solution comprises at least one ether.

4,612,300

NOVEL CATALYST FOR PRODUCING RELATIVELY NARROW MOLECULAR WEIGHT DISTRIBUTION OLEFIN POLYMERS

William M. Coleman, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,991

The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—113 **5 Claims**

1. In a catalyst which is the catalytic product resulting from reacting in an inert hydrocarbon medium

(A) at least one hydrocarbon soluble organomagnesium component represented by the formula $MgR''_{2}.xMR''_{y}$ wherein each R'' is independently a hydrocarbyl group having from 1 to 20 carbon atoms; M is a metal selected from Al, Zn, Si, Sn, B and P; y has a number corresponding to the valence of M and x has a value from zero to about 10;

(B) a sufficient quantity of at least one halide source so as to convert all of the organic groups attached to a magnesium atom in component (A) to a halide group; said halide source being selected from

(1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms and such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen; or

(2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl group having from 1 to about 20 carbon atoms, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y;

(C) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen and x has a value from zero to 4; and

(D) optionally, at least one compound containing at least one aromatic hydroxyl group or at least one aliphatic hydroxyl group or a mixture of such compounds; and

when components (A) and/or (B) do not contain or contain an insufficient quantity of aluminum, then

(E) an aluminum compound represented by the formula $AlR_{y'}X_{y''}$ wherein R is a hydrocarbyl group having from 1 to about 10 carbon atoms; X is halogen and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three is employed;

and wherein the components are employed in quantities so as to provide the following ratios:

(1) a Mg:Ti atomic ratio of from about 1:1 to about 200:1;

(2) components (C) and (D) are employed in quantities which provide a molar ratio of (D):(C) of from about 0:1 to about 10:1;

(3) an excess X to Al ratio of from about 0.0005:1 to about 10:1;

(4) an Al:Ti atomic ratio of from about 0.1:1 to about 2000:1;

the improvement which comprises employing in the reaction

(F) a vandium compound represented by the formulas $VO(X)_3$, $V(X)_4$ or $VO(OR)_3$ wherein X is halogen and R is a hydrocarbyl group having from 1 to 10 carbon atoms; the Mg:Ti ratio expressed above is expressed as a Mg:Ti+V ratio with the same values as the Mg:Ti ratio and wherein component (F) is employed in quantities which provides a V:Ti ratio of from about 0.1:1 to about 50:1.

4,612,301

METAL COORDINATION COMPLEXES OF HETEROPOLYACIDS AS CATALYSTS FOR ALCOHOL CONVERSION

Janie K. Currie, Russell; Arthur J. Cooper, Garfield Heights, and Frederick A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 17, 1985, Ser. No. 724,139

Int. Cl.[4] B01J *31/14, 31/12*

U.S. Cl. 502—154 **4 Claims**

1. A heteropolyacid salt catalyst having the formula:

$$[ML_q]_b{}^{m+}[N]_d{}^{n+}[X^{p+}Y_aZ_{(12-a)}O_{40}]^{-(8-p)}$$

wherein:

[ML] is an organometallic compound where M is at least one metal selected from Group IIIA, IVA, VA, IB, IIB, IVB, VB, VIA, Fe, Co and Ni; and L is an organic ligand selected from aniline, triethanolamine, triazine, benzyltrimethylammonium, benzylamino, cyclopentadienyl, and trimethyl (cyclopentadienylmethylene)ammonium,

N is selected from Na^+, Li^+, Cs^+, Ag^+, NH_4^+, Cu^{+2} and Mn^+,

X is at least one element selected from P, Si, As, T, Zr, B, Co, Cu or Sn,

Y and Z are independently selected from W, Mo or V,

$m+n=8-p$

$q=1-6$

$o<a\leqq 12$

$o\leqq d<3$

$b=1$ to 3.

4,612,302

CLINICAL USE OF SOMATOSTATIN ANALOGUES

Sandor Szabo, Brookline, Mass.; Klaus W. Usadel, Weinheim, and Horst Kessler, Schwalbach, both of Fed. Rep. of Germany, assignors to Brigham and Women's Hospital, Mass.

Filed Nov. 14, 1983, Ser. No. 550,978

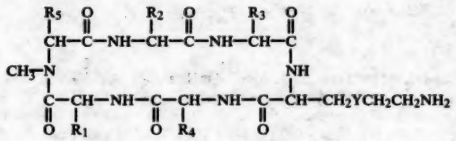
Int. Cl.[4] A61K *37/24;* C07K *7/26*

U.S. Cl. 514—11 **21 Claims**

1. A method of increasing clearance of exogenous colloidal particles from blood, which comprises:

administering by inhalation, intravenous injection, subcutaneous injection, intramuscular injection, intragastrically

or rectally to a vertebrate having a surplus of particles in the blood stream of said vertebrate an amount sufficient to increase the activity of phagocytes in said vertebrate of a somatostatin analogue of the formula



wherein

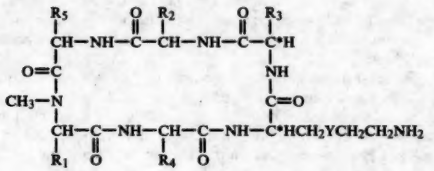
Y is $(CH_2)_m$ wherein m is 0, 1 or 2 or sulfur such that the sulfur is in any position along the chain;

R_1 and R_2 are independently lower alkyl; benzyl; substituted benzyl where the substituent is one or two of lower alkyl, halogen, hydroxy, amino, nitro or lower alkoxy; or lower alkyl substituted with a 5- or 6-membered heterocyclic ring;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent is lower alkyl, lower alkoxy, or halogen;

R_4 is lower alkyl, hydroxy lower alkyl, benzyl, carboxy lower alkyl, amino lower alkyl or substituted benzyl wherein the substituent is lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro; and

R_5 is hydrogen, lower alkyl, benzyl, or substituted benzyl wherein the substituent is lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro;



wherein

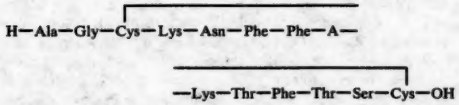
Y is $(CH_2)_m$ wherein m is 0, 1, or 2 or sulfur such that the sulfur is in any position along the chain;

R_1 and R_2 are independently lower alkyl; benzyl; substituted benzyl where the substituent is one or two of lower alkyl, halogen, hydroxy, amino, nitro or lower alkoxy; or lower alkyl substituted with a 5- or 6-membered heterocyclic ring;

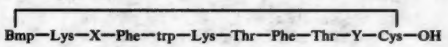
R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent is lower alkyl, lower alkoxy, or halogen;

R_4 is lower alkyl, hydroxy lower alkyl, benzyl, carboxy lower alkyl, amino lower alkyl or substituted benzyl wherein the substituent is lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro; and

R_5 is hydrogen, lower alkyl, benzyl, or substituted benzyl wherein the substituent is lower alkyl, lower alkoxy, hydroxy, halogen, amino or nitro; and the two asymmetric centers marked with an asterisk are either D or L, provided the two centers of asymmetry are the same, while the other asymmetric centers are D;



in which A represents an L-, D- or DL-5- or 6-fluoro-, bromo-, chloro-, or iodotryptophyl radical;



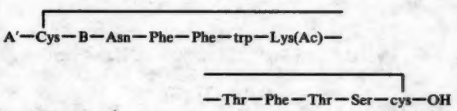
in which

Bmp represents a desaminocysteine radical,

X represents Asn or His,

trp represents D-Trp or D-Trp that is substituted in the phenyl ring by a halogen atom, and

Y represents the radical of a secondary α-amino acid having a maximum of 8 carbon atoms;



in which

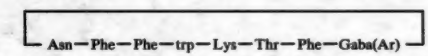
A′ represents H-Ala-Gly-, Ac-Ala-Gly-, H- or Ac-;

B represents Lys, Lys(Ac) or Lys(X) wherein X is an ϵ-amino-protecting group;

trp represents L-Trp, D-Trp or an analogous radical which carries in the indole nucleus a halogen atom;

cys represents L-Cys or D-Cys and

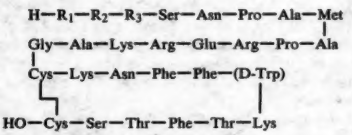
Ac represents an acyl radical of a substituted or unsubstituted alkanecarboxyclic acid present at the free amino group;



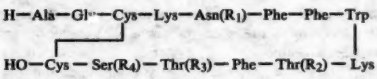
in which

trp represents unsubstituted L-Trp or D-Trp or an L-Trp or D-Trp in which the phenyl ring is substituted with a halogen atom, and

Gaba(Ar) represents the residue of a γ-aminobutyric acid substituted with a cyclic hydrocarbyl radical;



in which R_1 is Ser or des R_1, R_2 is Ala or des R_2, and R_3 is Asn or des R_3 and linear versions thereof in which the disulfide bridge is replaced by hydrogen sulfides;



wherein R_1, R_2, R_3 and R_4 are hydrogen or a carbohydrate moiety selected from the group consisting of hexoses and amino-hexoses modified in the 2-position with an amide group, which hexose has the pyranose structure, provided that at least one R group is not hydrogen, and pharmaceutically acceptable nontoxic salts thereof;

or cyclo [phe-Phe-trp-Lys-Thr-phe] in which phe represents D-, L-, or DL-Phenylalanine and trp represents D-, L-, or DL-tryptophan.

4,612,303

THERAPEUTIC AND/OR PREVENTIVE AGENT FOR OBSTRUCTIVE RESPIRATORY DISEASES

Naoshi Homma, Tochigi, and Jin Sato, Tokorozawa, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,068
Claims priority, application Japan, May 23, 1983, 58-89067
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—23 7 Claims

1. A method for treating and preventing bronchitis and asthma which comprises administering to a human patient afflicted with bronchitis or asthma, a pharmaceutical composition consisting essentially of a therapeutically effective amount of L-fucose, as the only active ingredient, in combination with a pharmaceutically acceptable carrier.

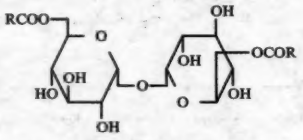
4,612,304

ANTITUMOR FORMULATION CONTAINING LIPOPOLYSACCHARIDE WITH TREHALOSE DERIVATIVES

Kazue Fukushi, Hirosaki, Japan, assignor to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,613
Int. Cl.[4] A61K *31/715*
U.S. Cl. 514—53 5 Claims

1. An antitumor formulation comprising an α,α-trehalose-6,6'-dicarboxylate, which is represented by the following general formula (I):



(I)

wherein R represents a C_1–C_{21} alkyl group, and a lipopolysaccharide, the ratio of compound I to the lipopolysaccharide ranging from 10:1 to 1:10.

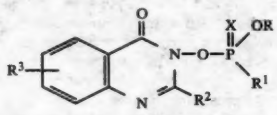
4,612,305

COMBATING PESTS WITH OXO-QUINAZOLINE-(THIONO)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 398,254, Jul. 14, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 636,520
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130344
Int. Cl.[4] A01N *57/16, 57/32, 57/24*
U.S. Cl. 514—80 6 Claims

1. A method of combating pests selected from the group consisting of Phaedon, Plutella, Phorbia and Tenebrio, comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of an oxoquinazoline-(thiono)-phosphoric(phosphonic) acid ester or ester-amide of the formula



R is an alkyl radical having 1 to 6 carbon atoms,

R^1 is an alkyl, alkoxy, alkoxyalkoxy, alkylthio, alkylamino or dialkylamino radical in each case having 1 to 6 carbon atoms per alkyl moiety or a phenyl radical,

R^2 is a alkoxy, alkylthio, alkylamino or dialkylamino radical in each case having 1 to 6 carbon atoms per alkyl moiety,

R^3 is a hydrogen, fluorine, chlorine or bromine atom, and

X is an oxygen or sulphur atom.

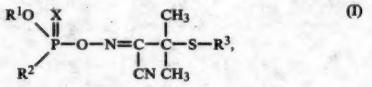
4,612,306

OXIMINOPHOSPHORIC ACID DERIVATIVES AND THEIR USE FOR CONTROLLING PESTS

Rainer Büerstinghaus, Weinheim, Erhard Henkes, Einhausen; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,789
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403203
Int. Cl.[4] A01N *57/04;* C07F *9/16*
U.S. Cl. 514—112 7 Claims

1. An oximinophosphoric acid derivative of the formula I



(I)

where

R^1 is straight-chain or branched alkyl of not more than 4 carbon atoms,

R^2 is straight-chain or branched alkoxy or alkylthio, each of not more than 4 carbon atoms, straight-chain or branched alkyl of not more than 3 carbon atoms, phenyl, amino, or straight-chain or branched alkylamino or dialkylamino, where alkyl in each case is of not more than 4 carbon atoms,

R^3 is straight-chain or branched alkyl of not more than 4 carbon atoms and X is oxygen or sulfur.

6. A process for controlling pests, wherein an effective amount of an oximinophosphoric acid derivative as defined in claim 1 is allowed to act on pests or on their habitat.

4,612,307

CONTROLLING AGENT FOR WOOD ROTTING FUNGI

Tadashi Ooishi, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 658,630, Oct. 9, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 800,092
Claims priority, application Japan, Oct. 21, 1983, 58-198152
Int. Cl.[4] A01N *57/10*
U.S. Cl. 514—147 1 Claim

1. A method for controlling *Serpula lacrymans* fungi which comprises contacting said fungi with a fungicidally effective amount of tolclofos-methyl.

4,612,308

25,26-DEHYDRO-1α,23(S,R)-DIHYDROXYCHOLECALCIFEROL AND ITS EPIMERS

Enrico G. Baggiolini, North Caldwell; Gary A. Truitt, Passaic; Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 29, 1984, Ser. No. 676,155
Int. Cl.[4] A61K *31/59*
U.S. Cl. 514—167 6 Claims

1. A compound 25,26-dehydro-1α,23S-dihydroxycholecalciferol, the 23R-epimer, or the epimeric mixture thereof.

3. A method for treating tumors which comprises administering a therapeutically effective amount of 25,26-dehydro-1α,23S-dihydroxycholecalciferol, the 23R-epimer or the epimeric mixture thereof.

4,612,309

ANTISECRETORY BICYCLIC BENZO-OXY HETEROCYCLIC ETHERS AND THIOETHERS

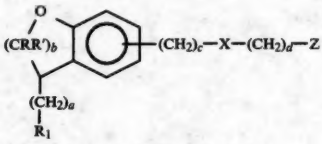
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville, and Kent W. Neuenschwander, Ambler, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Oct. 23, 1984, Ser. No. 664,063

Int. Cl.[4] A61K *31/55;* C07D *405/14*

U.S. Cl. 514—212 24 Claims

1. A compound of the formula:



wherein:

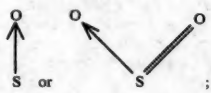
a is 0, 1 or 2;

b is 1 or 2;

c is 0 or 1;

d is 2, 3 or 4;

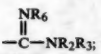
X is oxygen, sulfur,



Z is —NHR_4

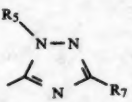
R and R^1 are each independently H or lower alkyl;

R_1 is —NR_2R_3,



R_2 and R_3 are each independently H or lower alkyl, or both together are lower alkylene or lower alkylindinyl and with the nitrogen to which they are attached form a 5, 6 or 7-membered ring heterocycle which may include one to three additional hetero atoms of N, O or S;

R_4 is selected from the group consisting of



R_5 is H or lower alkyl;

R_6 is H or lower alkyl or R_6 and R_2 together are ethylene or propylene and form a 5- or 6-membered ring together with the nitrogens to which they are attached;

R_7 is NR_8R_9, lower alkyl, aryl, arloweralkyl, lower alkoxy, aryloxy, aryloxy lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, halo, hydroxy, mercapto or lower alkyl mercapto;

R_8 is hydrogen, loweralkyl, lower alkenyl or arloweralkyl;

R_9 is hydrogen, COR_{10}, SO_2R_{11} or

R_{10} is hydrogen, loweralkyl, aryl, arloweralkyl, loweralkoxy, heteroaryl, or monocyclic heteroarylalkyl;

R_{11} is lower alkyl or aryl;

R_{12} is hydrogen, lower alkyl, cyclololoweralkyl, aryl or arloweralkyl;

wherein ar and aryl means phenyl or phenyl substituted by one or more substituents including lower alkyl, halo, carboxyl, amino, loweralkylamino, amido, hydroxyl, nitro, cyano or loweralkyl sulfonyl;

and wherein heteroaryl means furyl, pyridyl, thiazolyl, imidazolyl, oxazolyl, isooxazolyl, isothiazolyl or thienyl; or a pharmaceutically acceptable salt thereof.

22. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

4,612,310

ANTIRHEUMATICALLY ACTIVE SUPPOSITORIES

Adolf Knecht, Freiburg, Fed. Rep. of Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.

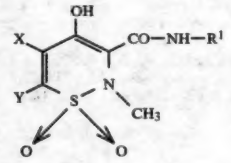
Filed Aug. 19, 1985, Ser. No. 768,297

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435843

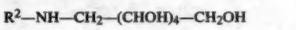
Int. Cl.[4] A61K *31/54*

U.S. Cl. 514—222 5 Claims

1. A therapeutic supository composition comprising a triglyceride suppository base and an antirheumatically active ingredient, in which the active ingredient consists of a salt containing approximately equimolar amounts of a compound of the formula



in which R^1 represents pyridine or 5-methyl-3-isoxazole and X together with Y forms a benzene or thiophene ring; and an organic base of the formula



in which R^2 represents a hydrogen atom or an alkyl group with one to six carbon atoms.

4,612,311

1,2,4-BENZOTHIADIAZINE OXIDE DERIVATIVES

Hubert Barth, Emmendingen; Johannes Hartenstein, Stegen-Wittental; Gerhard Satzinger, Denzlingen; Edgar Fritschi, St. Peter; Hartmut Osswald, and Gerd Bartoszyk, both of Waldkirch, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

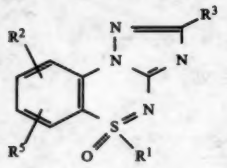
Filed Sep. 4, 1985, Ser. No. 772,501

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1984, 3433037

Int. Cl.[4] C07D *513/04;* A61K *31/54*

U.S. Cl. 514—222 10 Claims

1. A compound of the formula



in which

R^1 represents phenyl, unsubstituted or monosubstituted by halogen or alkoxy having one to six carbon atoms;

R^2 and R^5 which may be the same or different, represent hydrogen, halogen, or a nitro group; and

R^3 represents a hydrogen or hydroxy radical, an alkyl, alkoxyalkyl or alkoxy carbonyl radical with up to four carbon atoms, unsubstituted or substituted by halogen, hydroxy, amino, alkyl amino or dialkyl amino radicals or a phenyl radical, unsubstituted or substituted by halogen; or a pharmaceutically acceptable acid addition salt thereof, or its optical isomer thereof.

4,612,312

GLUTARIMIDE ANTIANXIETY AND ANTIHYPERTENSIVE AGENTS

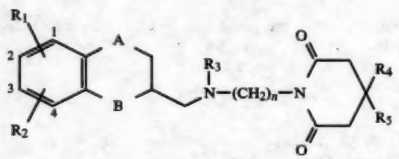
Marcel Hibert, and Maurice W. Gittos, both of Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 635,394, Jul. 30, 1984, abandoned. This application Jun. 13, 1985, Ser. No. 743,395

Int. Cl.[4] **C07D** *405/12;* **A61K** *31/395*

U.S. Cl. 514—225 **12 Claims**

1. A glutarimide having the formula



wherein R_1 and R_2 each independently represent hydrogen, a 1 to 4 carbon alkyl, a 1 to 4 carbon alkoxy, halogen, nitro, hydroxy, SO_3H, SO_2NH_2, and when R_1 and R_2 are taken together, form a fused phenyl group at the 1,2- or 3,4- positions, with the proviso that when R_1 and R_2 are identical they each represent a hydrogen, a 1 to 4 carbon alkyl, a 1 to 4 carbon alkoxy, hydroxy or a halogen group; A and B independently represent an oxo, a thio or an imino group having the formula —N(R_6)— wherein the R_6 group is hydrogen or a 1 to 4 carbon alkyl group; R_3 is a hydrogen, a 1 to 4 carbon alkyl or hydroxyethyl group; n is an integer of from 2 to 5; and R_4 and R_5 represent methyl groups or when taken together form a cyclopentane or cyclohexane ring; its enantiomers; and the pharmaceutically acceptable acid addition salts thereof.

11. A method for relieving the symptoms of anxiety in a patient in need thereof, which comprises administering to said patient an anxiolytic effective amount of a compound of claim 1.

4,612,313

PHARMACEUTICAL PHENYLACETONITRILE DERIVATIVES

Herbert Leinert, Heppenheim; Wolfgang Kampe, Heddesheim; Klaus Strein, Hemsbach; Bernd Müller-Beckmann, Grünstadt, and Wolfgang Bartsch, Viernheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

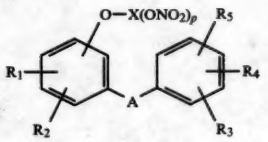
Filed Sep. 10, 1985, Ser. No. 774,354

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433383

Int. Cl.[4] **A61K** *31/495, 31/275;* **C07C** *121/80*

U.S. Cl. 514—255 **23 Claims**

1. A phenylacetonitrile derivative compound of the formula

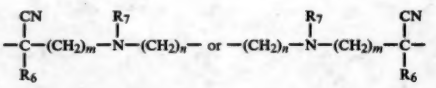


(I)

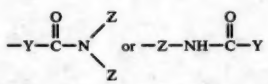
wherein

R_1, R_2, R_3, R_4 and R_5, are the same or different and are hydrogen, fluorine, chlorine, bromine, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, amino, or acylamino with up to 6 carbon atoms, or two adjacent substituents can together form methylenedioxy or ethylenedioxy,

A is



wherein R_6 is straight-chained, cyclic or branched, saturated or unsaturated alkyl containing 2 to 12 carbon atoms; R_7 is hydrogen or straight-chained or branched, saturated alkyl containing up to 6 carbon atoms; m is 2 or 3; n is 2 or 3; p is 1 or 2; and X is amino-substituted or unsubstituted straight-chained, cyclic or branched alkyl containing 2 to 10 carbon atoms, or is



(II) (II')

wherein Y and Z, which can be the same or different, are straight-chained or branched alkyl groups containing up to 8 carbon atoms or are monocycloalkyl or dicycloalkyl, alkyl-monocycloalkyl or alkyl-dicycloalkyl, or monocycloalkylalkyl or dicycloalkylalkyl groups, which groups are uninterrupted or interrupted by an oxygen or sulphur atom, and one of the groups Z can further be hydrogen or both Z groups are joined to form a ring containing 4 to 6 carbon atoms which is optionally interrupted by a further nitrogen or a further nitrogen which is substituted by alkyl or alkanoyl, the —O—NO_2 groups being substituents of Y as well as of Z; and

the salts thereof with physiologically acceptable acids.

22. A method for treatment of heart and circulatory diseases by reducing blood preload pressure of the heart, comprising administering an effective amount of the compound of claim 1.

4,612,314
SUBSTITUTED 9-(1 OR 3-MONOACYLOXY OR 1,3-DIACYLOXY-2-PROPOXYMETHYL) PURINES AS ANTIVIRAL AGENT

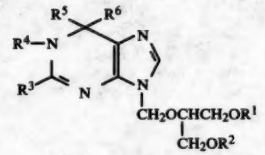
Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 451,262, Dec. 22, 1982, which is a continuation-in-part of Ser. No. 344,703, Feb. 1, 1982, abandoned. This application Jun. 13, 1985, Ser. No. 744,582

Int. Cl.[4] **C07D** *473/18;* **A61K** *31/52*

U.S. Cl. 514—261 **5 Claims**

1. A compound of the formula



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

R^1 and R^2 are both —C(O)R^7 wherein R^7 is 1-adamantyl;

R^3 is amino;

(a) R^6 is hydrogen or amino and R^4 together with R^5 is a bond; or

(b) R^5 together with R^6 is a keto group and R^4 is hydrogen.

4,612,315
BIOLOGICALLY-ACTIVE 1,3-DIPROPYL-8-PHENYLXANTHINE DERIVATIVES

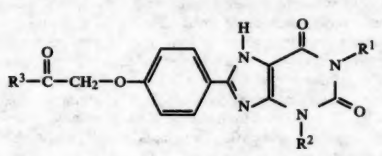
Kenneth A. Jacobson, Silver Spring, Md.; John W. Daly, Washington, D.C., and Kenneth L. Kirk, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 26, 1984, Ser. No. 664,953

Int. Cl.[4] **A61K** *31/41;* **C07D** *473/06*

U.S. Cl. 514—263 **8 Claims**

1. Compounds having the structural formula



wherein

R^1 and R^2=an alkyl of 1–6 carbon atoms;

R^3=hydroxy, alkoxy of 1 to 4 carbon atoms, phenoxy, N-succinimide; or wherein

R_3=R^4R^5N

wherein

R^5 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or alkylaryl groups wherein the alkyl has 1 to 4 carbon atoms and the aryl is phenyl; and

wherein R^4=R^5 or x$(CH_2)_n$NH

wherein x=primary, secondary or tertiary amino group wherein the substituents are hydrogen, alkyl having 1–6 carbon atoms or alkylaryl wherein the alkyl contains 1–6 carbon atoms and the aryl is phenyl; or secondary or tertiary amino group wherein one of the amine substituents is a p-hydroxybenzyl group or hydroxy or carboxy or acyl-amino group of the form R^6NH and the other is lower alkyl;

wherein R^6=a carboxyalkyl group having 1–6 carbon atoms optionally substituted with at least one halogen; or

naturally occurring alpha-amino acids of the L configuration or their D configuration isomers or

N-benzyloxycarbonyl alpha-amino acid of the L or D configuration; or

biotin, bonded through the amide linkage directly or through an amide linkage to a naturally occurring alpha-amino acid having between 2 and 6 carbon atoms or 2-thiopheneacetic acid through the carboxyl group thereof;

n=1–10

and pharmaceutically acceptable salts.

4,612,316
TRICYCLIC AMINES WITH CENTRAL DOPAMINERGIC ACTIVITY

Bengt R. Andersson, Mölndal; Folke L. Arvidsson, Upsala; Per A. E. Carlsson; John S. M. Hjort, both of Gothenburg; Anette M. Johansson, Upsala; Per L. Lindberg, Askim; John L. G. Nilsson, Tullinge; Domingo Sanchez, Floda; Kjell A. I. Svensson, Gothenburg, and Hakan V. Wikström, Partille, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

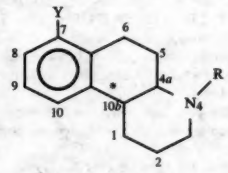
Filed Apr. 19, 1984, Ser. No. 601,981

Claims priority, application Sweden, Apr. 27, 1983, 8302361

Int. Cl.[4] **A61K** *31/445;* **C07D** *221/10*

U.S. Cl. 514—290 **8 Claims**

8. A method of inducing selective dopamine autoreceptor stimulation in patients wherein such stimulation is desired comprising administering a compound of the formula



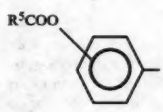
I

wherein

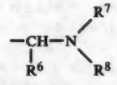
C^1 and N^4 are in trans configuration to each other,

Y is OH, R^1COO, R^2R^3NCOO— or R^4O

whereby R^1 is an aliphatic hydrocarbon residue having 1–17 carbon atoms, a phenyl, 2,6-dimethylphenyl or 3- or 4-hydroxyphenyl group or a 3- or 4-alkanoyloxyphenyl group with the formula



wherein R^5 is an alkyl group having 1–6 carbon atoms, or R^1 is a group



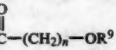
wherein R^6 is hydrogen, an alkyl group having 1 to 5 carbon atoms or a phenyl group, R_7 is hydrogen, an alkyl group having 1 to 5 carbon atoms or an acyl group having 2 to 7 carbon atoms and R_8 is hydrogen or an alkyl group having 1 to 5 carbon atoms,

R^2 is hydrogen or an alkyl group having 1 to 5 carbon atoms, a phenethyl, benzyl or phenyl group which may be mono-

or disubstituted in the aromatic part with a methyl, methoxy, hydroxy, nitro or cyano group or a halogen,

R^3 is H, an alkyl group having 1 to 5 carbon atoms or a phenyl group, and

R^4 is an allyl or benzyl group, and R is hydrogen or the group



wherein n is 3 or 4 and R^9 is hydrogen, an alkanoyl group having 2–6 carbon atoms or benzoyl,

or the base or a pharmaceutically acceptable acid addition salt thereof,

said compound being administered in an amount effective to evoke selective dopamine autoreceptor stimulation.

4,612,317

TETRAHYDRO-β-CARBOLINE DITHIOIC ACID DERIVATIVES AND TREATMENT OF LIVER DISEASES

Ikuo Iijima, Urawa; Yutaka Saiga, Ageo; Toshikazu Miyagishima, Wako; Yuzo Matsuoka, Tondabayashi, and Mamoru Matsumoto, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

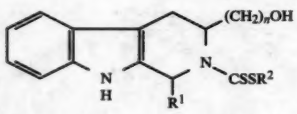
Filed May 18, 1984, Ser. No. 611,965

Claims priority, application United Kingdom, Jun. 4, 1983, 8315403

Int. Cl.[4] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—292 **37 Claims**

1. A tetrahydro-β-carboline derivative of



(I)

wherein R^1 is hydrogen atom, a lower alkyl group, a cycloalkyl group, phenyl group or a hydroxy-substituted lower alkyl group, R^2 is hydrogen atom, an alkyl group or a group of the formula: $-(CH_2)_mY$, Y is thienyl group or an unsubstituted phenyl group or a substituted phenyl group substituted by a substituent selected from the group consisting of a halogen atom, formylamino, amino, nitro, a lower alkyl group having 1 to 4 carbon atoms and a lower alkoxy group having 1 to 4 carbon atoms and each one of m and n is an integer of 1 or 2 or a pharmaceutically acceptable salt thereof.

18. A composition for treating or preventing liver damage, wherein the liver damage is a liver disease associated with centrilobular necrosis, periportal necrosis, discrete lobular necrosis, mesenchymal reaction, fatty liver, drug-induced hepatopathy, viral hepatitis, alcoholic hepatitis, jaundice or hepatocirrhosis, which comprises as the essential active ingredient a therapeutically or prophylactically effective amount of a tetrahydro-β-carboline derivative as claimed in claim 1 in admixture with a pharmaceutically acceptable carrier or diluent.

4,612,318

CNS-DEPRESSANT AND ANALGESIC TRICYCLO-[PYRAZOLO-[3,4-6]-PYRIDINE] DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Giorgio Winters, Milan, Italy, assignor to Gruppo Lepetit S.p.A., Italy

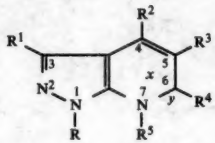
Filed Sep. 19, 1983, Ser. No. 533,909

Claims priority, application Italy, Sep. 22, 1982, 22375 A/82

Int. Cl.[4] A61K *31/415;* **C07D** *471/04*

U.S. Cl. 514—293 **4 Claims**

1. A pyrazolo[3,4-b]pyridine having the formula



or a physiologically acceptable acid addition salt thereof wherein

R and R^1 independently represent (C_{1-6})alkyl, (C_{3-7})cycloalkyl, phenyl, substituted phenyl, phenyl(C_{1-4})alkyl, or substituted phenyl(C_{1-4})alkyl;

R^2 and R^3 taken together represent a $-(CH_2)_n-$group wherein n is an integer selected from 3, 4 and 5, and where one of the $-CH_2-$groups may be substituted with the group

R^4 represents R^8 or $-OR^9$;

R^8 represents hydrogen, (C_{1-4})alkyl, phenyl, substituted phenyl, phenyl(C_{1-4})alkyl, substituted pheny(C_{1-4})alkyl;

R^9 represents hydrogen, (C_{1-4})alkyl, (C_{2-6})alkanoyl-(C_{1-4})alkyl, hydroxy(C_{2-4})alkyl, halo(C_{2-4})alkyl, amino(C_{2-4})alkyl, or mono- or di-(C_{1-4})alkylamino$((C_{2-4})$alkyl;

R^5 represents nil, x is an additional bond, and y is nil with the proviso that when R^4 is R^8, R^2 must be different from methyl, wherein the term "substituted phenyl" alone or in combination with other groups, refers to a phenyl group wherein one, two or three hydrogen atoms are replaced by substituents independently selected from, chloro, bromo, fluoro, cyano, nitro, hydroxy, mercapto, trifluoromethyl, (C_{1-4})alkyl, (C_{2-4})alkenyl, (C_{3-7})cycloalkyl, (C_{1-4})alkoxy, (C_{1-4})alkylthio, (C_{1-4})alkoxycarbonyl, carboxy(C_{1-4})alkyl, carboxy(C_{3-7})cycloalkyl, sulfynyl, and (C_{1-4})alkylsulfynyl.

4. A CNS-depressant or analgesic composition comprising a CNS-depressant or analgetic effective amount of a compound according to claim 1, in combination with a pharmaceutically acceptable carrier or diluent.

4,612,319

BRIDGED QUINOLIZIDINYLBENZAMIDES, COMPOSITIONS CONTAINING THEM AND METHODS FOR THEIR USE

Francis D. King, Newport, England, assignor to Beecham Group p.l.c., Middlesex, England

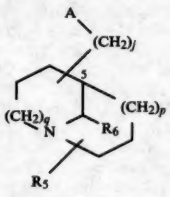
Filed Apr. 12, 1983, Ser. No. 484,317

Claims priority, application United Kingdom, Apr. 14, 1982, 8210847

Int. Cl.[4] A61K *31/445;* **C07D** *453/00*

U.S. Cl. 514—305 **8 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt, or N-oxide thereof, or a solvate of any of the foregoing:



(I)

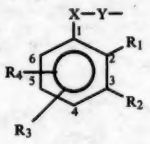
wherein

p is 0 to 2; q is 0 to 3; j is 0 to 4;

one of R_5 and R_6 is hydrogen, C_{1-6} alkyl, phenyl or phenyl-C_{1-3} alkyl, which phenyl moieties may be substituted by C_{1-6} alkyl, C_{1-6} alkoxy, CF_3 or halogen;

and the other of R_5 and R_6 is hydrogen or C_{1-6} alkyl; and

A is of formula (II):



(II)

wherein R_2, R_3 and R_4 are each independently selected from hydrogen, halogen, CF_3, C_{1-7} carboxylic acyl, C_{1-7} carboxylic acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6}-alkylsulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphonyl, C_{1-6} alkylsulphinyl, nitro or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-N-C_{1-4} alkylamino optionally N-substituted by one or two C_{1-6} alkyl groups; or any two together are C_{1-2} alkylenedioxy; and

(i) R_1 is a C_{1-6} alkoxy group; and one of X and Y is CO and the other is NH; or

(ii) X is CO and Y is NR_{16} where R_1 and R_{16} together are C_{1-2} alkylene.

7. A method of treatment of emesis, disorders relating to impaired gastro-intestinal motility or of disorders of the central nervous system in mammals which comprises the administration of an effective amount of a compound according to formula (I) of claim 1, or a pharmaceutically acceptable salt thereof, or N-oxide thereof, or a solvent adduct of any of the foregoing as hereinbefore defined, to the sufferer.

4,612,320

AMINOPROPANOL DERIVATIVES OF 1-(2-HYDROXYPHENYL)-3-PHENYLPROPANOLS AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Albrecht Franke; Josef Gries, both of Wachenheim; Claus D. Müeller, Viernheim, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,785

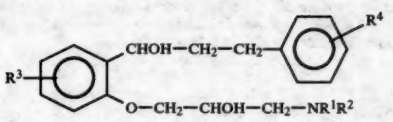
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309595

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/445, 31/135;* **C07C** *97/10;* **C07D** *295/12, 295/08*

U.S. Cl. 514—317 **16 Claims**

1. An aminopropanol derivative of a 1-(2-hydroxphenyl)-3-phenylpropanol of the formula I



I

where R^1 and R^2 are identical or different and are each hydrogen, or alkyl, or alkynyl, each of not more than 6 carbon atoms, or a phenylalkyl radical where alkyl is of not more than 6 carbon atoms and the phenyl radical is substituted by alkoxy of not more than 3 carbon atoms, or R^1 and R^2, together with the nitrogen atom to which they are bonded, form a piperidino ring which is unsubstituted or substituted by 4-phenyl and 4-hydroxyl, R^3 is hydrogen, or alkyl of not more than 3 carbon atoms, R^4 is hydrogen, alkyl of not more than 3 carbon atoms, chlorine, or a radical NR^5R^6, where R^5 and R^6 are identical of different and are each alkyl of not more than 6 carbon atoms, and its physiologically tolerated addition salts with acids.

16. The method of treating cardiac disorders in a patient suffering therefrom, which comprises administering an effective amount of a compound of the formula I according to claim 1.

4,612,321

5-PYRIDYL-1,3-THIAZOLE DERIVATIVES

Shinji Terao, Osaka, and Yoshitaka Maki, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

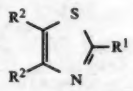
Filed Sep. 5, 1984, Ser. No. 647,436

Claims priority, application Japan, Sep. 9, 1983, 58-167042; Apr. 17, 1984, 59-77819

Int. Cl.[4] C07D *405/14;* **A61K** *31/44*

U.S. Cl. 514—338 **7 Claims**

1. A compound of the formula:



wherein

R^1 is (1) an alkyl group having 1 to 10 carbon atoms, which is unsubstituted or substituted by hydroxyl, amino, a lower alkylamino having 1 to 4 carbon atoms, carboxyl or a lower alkoxycarbonyl having 2 to 5 carbon atoms, (2) an alkenyl group having 2 to 4 carbon atoms, which is unsubstituted or substituted by hydroxyl, carboxyl or a lower alkylamino group having 1 to 4 carbon atoms, (3) a phenyl or naphthyl group which is unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of carboxyl, halogen, 2-carboxy-ethenyl, 2-carboxy-1-propenyl, acetoxy and lower alkyl having 1 to 4 carbon atoms, (4) an aralkyl group having 7 to 12 carbon atoms, which is unsubstituted or substituted by methoxy or halogen, (5) cycloalkyl having 3 to 7 carbon atoms, which is unsubstituted or substituted by alkyl having 1 to 3 carbon atoms, (6) an amino group which is unsubstituted or substituted by one or two substituents selected from the group consisting of lower alkyl having 1 to 4 carbon atoms, aralkyl having 7 to 10 carbon atoms, phenyl, pyridyl, 5-methyl-3-pyridyl, 4-methyl-2-pyridyl, C^{1-4}-alkyl-O-CO-CH_2-CO-, lower alkylcarbonyl having 2 to 5 carbon atoms, carboxycarbonyl, lower alkoxycarbonylcarbonyl having 3 to 6 carbon atoms, lower alkoxycarbonyl having 2 to 4 carbon atoms, and halogenoalkoxycarbonyl having 2 to 5 carbon atoms, or (7) a piperidino or pyrrolidino group;

R_2 is a pyridyl group which is unsubstituted or substituted by alkyl group having 1 to 4 carbon atoms, and R^3 is a phenyl or naphthyl group which is unsubstituted or substituted by 1 to 3 substituents selected from the

group consisting of lower alkoxy having 1 to 4 carbon atoms, lower alkyl having 1 to 4 carbon atoms, hydroxyl, halogen, trimethylene and methylenedioxy, or a pharmaceutically acceptable salt thereof.

4,612,322
AZOLE TYPE DIOXOLANE DERIVATIVES

Masaru Ogata, Hyogo; Hiroshi Matsumoto, Osaka; Shiro Kida, Osaka, and Katsuya Tawara, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

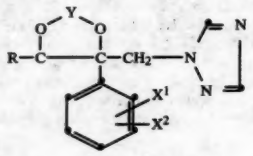
Filed Jul. 20, 1984, Ser. No. 632,852

Claims priority, application Japan, Jul. 20, 1983, 58-133040

Int. Cl.[4] A01N *43/50, 43/653;* **C07D** *405/06;* **A61K** *31/41*

U.S. Cl. 514—383 **8 Claims**

1. A compound of the formula



wherein

R is C_1–C_5 alkyl or phenyl optionally substituted by 1 to 3 members selected from halogen, C_1–C_5 alkyl, and C_1–C_5 alkoxy;

X^1 and X^2 each is hydrogen, halogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, and

Y is C═O, C═S or C═O,

or an acid addition salt thereof.

8. An antimycotic composition which comprises an antimycotically effective amount of a compound or a salt thereof according to claim 1 with one or more carriers, diluents and/or excipients.

4,612,323
INSECTICIDAL AND ACARICIDAL DERIVATIVES OF 1-BENZYLBENZIMIDAZOLE

Hirosi Kisida, Takarazuka, and Toshihiko Yano, Ikoma, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

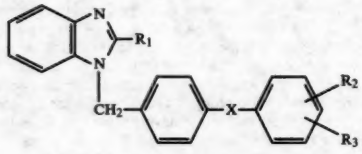
Filed Jun. 11, 1984, Ser. No. 619,178

Claims priority, application Japan, Jun. 27, 1983, 58-116744; Jan. 30, 1984, 59-16595

Int. Cl.[4] A01N *43/52;* **C07D** *235/08*

U.S. Cl. 514—394 **19 Claims**

1. A benzimidazole derivative of the formula:



wherein R_1 is a hydrogen atom or a lower alkyl group, R_2 and R_3 are, the same or different, each a hydrogen atom, a halogen atom, a nitro group, a cyano group, a C_1–C_8 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, a cyclo(C_3–C_6)alkyl group, a C_1–C_6 alkoxy group, a C_2–C_6 alkenyloxy group, a C_2–C_6 alkynyloxy group, a cyclo(C_3–C_6)alkyloxy group, a C_1–C_6 alkylthio group, a C_2–C_6 alkenylthio group, a C_2–C_6 alkynylthio group, a cyclo(C_3–C_6)alkylthio group, a di(C_1–C_6)alkylamino group, a C_1–C_6 alkylsulfonyl group, a C_1–C_6 alkylsulfinyl group, a halo(C_1–C_6)alkyl group, a halo(C_2–C_6)alkenyl group, a halo(C_2–C_6)alkynyl group, a halo(C_1–C_6)alkoxy group, a halo(C_2–C_6)alkenyloxy group, a halo(C_2–C_6) alkynyloxy group, a halo(C_1–C_6)alkylthio group, a halo(C_2–C_6)alkenylthio group, a halo(C_2–C_6)alkynylthio group, a halo(C_1–C_6)alkylsulfonyl group, a halo(C_1–C_6)alkylsulfinyl group, a C_1–C_5 alkoxy(C_1–C_5)alkyl group, a halo(C_1–C_5)alkoxy(C_1–C_5)alkyl group, a C_1–C_5 alkylthio(C_1–C_5)alkyl group, a halo(C_1–C_5)alkylthio(C_1–C_5)alkyl group, a C_1–C_5 alkoxy(C_1–C_5)alkoxy group, a halo(C_1–C_5)alkoxy(C_1–C_5)alkoxy group, a C_2–C_5 alkenyloxy(C_1–C_4)alkyl group, a C_2–C_5 alkynyloxy(C_1–C_4)alkyl group, a C_2–C_5 alkenyloxy(C_1–C_4)alkoxy group, a C_2–C_5 alkynyloxy(C_1–C_4)alkoxy group, a C_1–C_5 alkoxy(C_1–C_5)alkylthio group, a C_1–C_5 alkylthio(C_1–C_5)alkoxy group, or a C_1–C_5 alkylthio(C_1–C_5)alkylthio group, or R_2 and R_3 are combined together to form a 3,4-methylenedioxy group, a 3,4-difluoromethylenedioxy group, a 3,4-trifluoroethylenedioxy group, a 3,4-trimethylene group or a 3,4-tetramethylene group and X is an oxygen atom, a sulfur atom, a methylene group, a sulfonyl group, a sulfinyl group or an imino group.

18. A method for controlling or exterminating insects and/or acarids which comprises applying as the active ingredient an effective amount of the benzimidazole derivative according to claim 1 to the locus where insects and/or acarids propagate.

4,612,324
IMIDAZOLE DERIVATIVES FOR TREATING JOINT DISEASES AND WILSON'S DISEASE

Colin H. Cashin, Preston near Hitchin; Noel A. Roberts, and Brian P. Tong, both of Harpenden, all of Great Britain, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

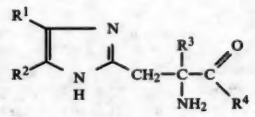
Filed Feb. 1, 1984, Ser. No. 576,083

Claims priority, application United Kingdom, Feb. 15, 1983, 8304182; Nov. 2, 1983, 8329238

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—400 **3 Claims**

1. A method for treating degenerative joint diseases or Wilson's disease which comprises administering to a host requiring the same an effective amount of a D- or L-compound of the formula



I

or a racemic mixture thereof wherein R^1, R^2 and R^3 each individually is hydrogen or lower alkyl and R^4 is hydroxy, lower alkoxy, lower alkoxy in which one of the hydrogen atoms has been replaced by unsubstituted phenyl or phenyl carrying one or more substituents selected from the group consisting of lower alkyl, lower alkoxy and halogen, amino, mono(lower alkyl)-amino or di(lower alkyl)amino,

or a pharmaceutically acceptable salt thereof.

4,612,325
5-AROYL-6-ALKYLTHIO-1,2-DIHYDRO-3H-PYRROLO(1,2-A)PYRROLE-1-CARBOXYLIC ACIDS AND USE THEREOF AS ANALGESICS AND ANTI-INFLAMMATORIES

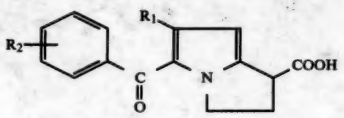
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Coyoacan, Mexico, assignors to Syntex (U.S.A) Inc., Palo Alto, Calif.

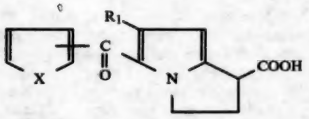
Filed Jun. 8, 1982, Ser. No. 386,174

Int. Cl.[4] C07D *403/04;* **A61K** *31/395*

U.S. Cl. 514—413 **42 Claims**

1. A compound selected from the group of those represented by the formula:


(1)


(2)

and the pharmaceutically acceptable, non-toxic esters and salts thereof, wherein

R_1 is lower alkylthio, lower alkylsulfinyl, or lower alkylsulfonyl;

R_2 is hydrogen, hydroxy, lower alkyl, vinyl, cyclohexyl, cyclopropyl, lower alkoxy, fluoro, chloro, bromo, trifluoromethyl, trifluoromethoxy, nitro, amino, lower alkylcarbonylamino, lower alkylthio, lower alkylsulfonyl or lower alkylsulfinyl;

X is oxygen, sulfur or N—R_3 where R_3 is hydrogen or lower alkyl.

42. A method for treating inflammation or pain in mammals which method comprises administering to a mammal in need thereof a therapeutically effective amount of compound of claim 1.

4,612,326

BIOCIDAL SULFUR-CONTAINING BIS-IMINO CARBAMATE COMPOUNDS

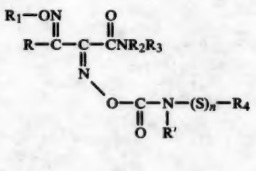
Themistocles D. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 957,561, Nov. 3, 1978, Pat. No. 4,435,421. This application Jun. 18, 1982, Ser. No. 389,980

Int. Cl.[4] C07D *317/44, 333/52, 307/78;* **A01N** *43/02*

U.S. Cl. 514—443 **15 Claims**

1. A compound of the formula:

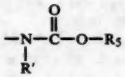


wherein:

n=1 or 2;

R, R', R_1, R_2, and R_3 are individually alkyl groups of one to four carbon atoms;

R_4 is a group of the formula:



wherein:

R_5 is dihydrobenzofuranyl, benzodioxolanyl, or benzothienyl group all of which may be unsubstituted or substituted with one or more alkyl groups.

15. A method of controlling at least one member of insects, acarids and nematodes which comprises subjecting the insects, acarids, and nematodes to an insecticidally, acaricidally or nematocidally effective amount of a compound of claim 1.

4,612,327

REPELLENT COMPOSITIONS AGAINST INSECTS, TICKS AND MITES EMPLOYING MIXTURES OF O-ALKYL-N-PHENYLTHIOCARBAMATES AND DEET

Akira Matukuma, Kanagawa; Yohji Takahashi, Tokyo, and Yoshihiko Kondo, Chiba, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

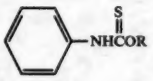
Filed Apr. 12, 1985, Ser. No. 722,257

Claims priority, application Japan, Apr. 13, 1984, 59-74738

Int. Cl.[4] A01N *47/10*

U.S. Cl. 514—479 **4 Claims**

1. A repellent composition against insects, ticks and mites, comprising at least one O-alkyl-N-phenylthiocarbamate of the formula (I):


(I)

wherein R denotes an alkyl group of from 1 to 3 carbon atoms, and N,N-diethyl-m-toluamide, and wherein the weight ratio of the O-alkyl-N-phenylthiocarbamate of the formula (I) to N,N-diethyl-m-toluamide is from 0.05:1 to 3.0:1.

4,612,328

ADMIXTURES OF 2-BROMO-2-BROMOMETHYLGLUTARONITRILE AND METHYLENE BIS(THIOCYANATE)

John A. Jakubowski, Piscataway, N.J., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 7, 1984, Ser. No. 679,430

Int. Cl.[4] A01N *47/40, 47/48*

U.S. Cl. 514—515 **4 Claims**

1. A method of inhibiting microbial growth, wherein said microbial growth is selected from the group consisting of *Pseudomonas stutzen, Pseudomonas Fluorescens, Pseudomonas aeruginosa, Saccharomyces cerevisiae, Aspergillus niger, Penicillivm funiculosum, Candida sp., Fusarium sp., Cephelosporium sp., Trichoderma viride, Cladosporium herbarum, Aspergillus fumigatus, Pullularia pullulans, Ceratocystic pilifera, Cephaloascus fragrans* and mixtures thereof, comprising contacting said microbial growth with an effective amount of an admixture comprising:

(a) 2-bromo-2-bromomethylglutaronitrile and

(b) methylene bis(thiocyanate),

wherein the weight ratio of (a):(b) ranges from about 1:2.5 to 10:1.

4,612,329

PHARMACEUTICAL ALPHA-AMINOALKYL-ALPHA-ALKYL-PHENYLACETONITRILES

Yasuo Itoh; Hideo Kato; Eiichi Koshinaka; Nobuo Ogawa; Sakae Kurata; Hiroyuki Nishino, and Toshihiko Yoshida, all of Fukui, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi Fukui, Japan

Filed Oct. 11, 1985, Ser. No. 786,742

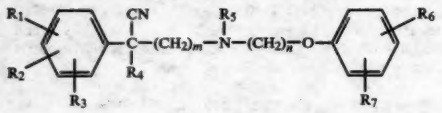
Claims priority, application Japan, Oct. 17, 1984, 59-216399; Jul. 22, 1985, 60-160278

Int. Cl.[4] A61K *31/275;* **C07C** *121/78*

U.S. Cl. 514—523 **13 Claims**

1. Alpha-aminoalkyl-alpha-alkylphenylacetonitrile derivatives represented by the general formula (I)

(I)



wherein R_1, R_2, and R_3, which may be the same or different, each represents hydrogen or lower alkoxy, R_4 represents a straight- or branched-chain lower alkyl, R_5 represents hydrogen or lower alkyl, R_6 and R_7, which may be the same or different, each represents hydrogen, halogen, lower alkyl, halogeno lower alkyl, lower alkoxy, nitro, amino, hydroxyalkyl, benzyloxy, cyano, or piperidinomethyl, and m and n are each an integer selected from 2 and 3, and pharmaceutically-acceptable acid addition salts thereof.

4,612,330

ANTIINFLAMMATORY METHOD

Jon S. Mynderse, and Rosanne Bonjouklian, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 4, 1985, Ser. No. 697,997

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—557 **3 Claims**

1. A method of treating inflammation and arthritis in mammals which comprises administering to said mammal an effective amount of Punaglandin-1 or Punaglandin-2.

4,612,331

SKIN TREATMENT COMPOSITION

Martin D. Barratt, Sharnbrook; Paul A. Bowser, Wirral; James A. Durrant, Bebington; Dieno George; Keith J. Hall, both of Wirral; John C. Hill, South Wirral; Michael R. Lowry, Chester, and Colin Prottey, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 462,641, Jan. 31, 1983, Pat. No. 4,507,319. This application Jan. 4, 1985, Ser. No. 688,948

Claims priority, application United Kingdom, Feb. 2, 1982, 8202886; Jul. 20, 1982, 8220981

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/20*

U.S. Cl. 514—558 **1 Claim**

1. A cosmetically acceptable aqueous composition for topical application to human skin, which comprises:

(i) from 0.1 to 20% by weight of 2-hydroxyoctanoic acid;

(ii) from 0.1 to 20% by weight of 2-hydroxypropionic acid; and

(iii) an amount of an alkanolamine sufficient to adjust the pH of the composition to a value of from 3.8 to 4.5.

4,612,332

NOVEL POLYMERIC FOAMS AND FOAMING COMPOSITIONS

Jan Bock, Bridgewater; Hartley H. Downs, Annandale; Donald B. Siano, Lebanon, and Salvatore J. Pace, Glen Gardner, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

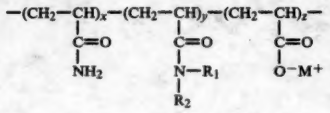
Filed Dec. 12, 1985, Ser. No. 808,035

Int. Cl.[4] C08J *9/30*

U.S. Cl. 521—65 **11 Claims**

1. A process for forming a foamed polymeric aqueous solution which comprises the steps of:

(a) dissolving about 0.01 to about 5.0 parts by weight of a copolymer in 100 parts of weight of said water to form a solution, said copolymer having the formula:



wherein R_1, having about 6 to 22 carbons, is an alkyl group, straight chained or branched or cycloalkyl group; R_2 is the same or different alkyl group as R_1 or hydrogen; x is about 50.0 to about 99.0 mole percent; and y is about 10 to about 0.1 mole percent; z is about 0.0 to about 50.0 mole percent; and M^+ is an alkali metal or ammonium cation;

(b) mixing said solution of said water and said copolymer with said gas under sufficient agitation conditions, at a sufficient temperature for a sufficient time to form said foamed polymeric aqueous solution.

4,612,333

FOAMED GYPSUM FILTER CONTAINING CARBONACEOUS MATERIAL

Neiko I. Vassileff, 1440 Midland Ave., Bronxville, N.Y. 10708

Filed Mar. 22, 1985, Ser. No. 715,118

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—83 **33 Claims**

1. A foamed gypsum filter for filtering oxygenated gases comprising carbonaceous material.

4,612,334

POROUS POLYMERS

Keith Jones; Barry R. Lothian; Alexander Martin; Graham Taylor, and Zia Haq, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,279

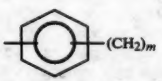
Claims priority, application United Kingdom, Mar. 5, 1984, 8405680

Int. Cl.[4] C08F *14/00, 114/00*

U.S. Cl. 521—146 **10 Claims**

1. A highly porous crosslinked, functionalised polymer, crosslinked from 1 to 20% and having interconnected cavities or chambers of micron dimensions whose total pore volume is greater than 85% (5.6 cc/g) in its solvent swollen state and having a capacity for spontaneous water absorption from its dry state of at least 3 g liquid per gram of polymer and having a capacity for saline absorption (10% NaCl) such that the ratio of saline to water absorption is greater than 0.1, said polymer comprising structural units

in which A represents a crosslinked carbon chain, Y is an optional spacer group and Z is an ionic or polar functional group, selected from lower alkyl cationic quaternary nitrogen groups of 10 carbon atoms or less, alkyl amine oxide groups of 8 carbon atoms or less, alkyloxy groups, a metal or ammonium or substituted ammonium salt of a sulphuric, carboxylic, phosphoric or sulphonic acid group or a mixture of such groups, except that where Z is a sulphonic acid Y does not represent



when m = 0

4,612,335
POLYOXYALKYLENE POLYETHER AMINO ALCOHOLS CONTAINING A TERTIARY HYDROXYL GROUP AND FLEXIBLE POLYURETHANES MADE THEREFROM

Michael Cuscurida, and Howard P. Klein, both of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

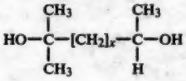
Filed May 6, 1985, Ser. No. 731,195
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—167 **10 Claims**

1. A method for preparing a polyoxyalkylene polyether amino alcohol containing a tertiary hydroxyl group which comprises the steps of:

(a) alkoxylating a glycol feedstock under basic alkoxylation conditions with an epoxide to provide a polyoxyalkylene polyether glycol intermediate, and

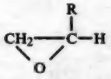
(b) reductively aminating said polyoxyalkylene polyether glycol under reductive amination conditions in the presence of a nickel, copper, chromia reductive amination catalyst, ammonia and hydrogen to thereby provide said polyoxyalkylene polyether amino alcohol containing said tertiary hydroxyl group,

(c) said glycol feedstock having the formula:



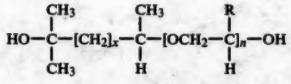
I

(d) said epoxide having the formula:



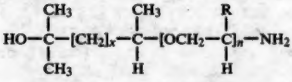
II

(e) said polyoxyalkylene polyether intermediate having the formula:



III

(f) said polyoxyalkylene polyether amino alcohol having the formula:



IV

(g) wherein, in said formulae, R represents hydrogen or a methyl or an ethyl group, x represents a number having an average value of about 1 to about 4 and n represents a number having an average value of about 1 to about 40.

4,612,336
PROCESS FOR PREPARING WATER-SOLUBLE ACRYLIC POLYMERS BY IRRADIATING AQUEOUS MONOMER SOLUTIONS CONTAINING A SURFACTANT

Akira Yada, Kusatsu; Shusaku Matsumoto, Kyoto; Yoshihiro Kawamori, Joyo; Takao Saito, Nagaokakyo; Tadashi Nishiyama, and Yoshitugu Adachi, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Feb. 22, 1985, Ser. No. 704,414
Claims priority, application Japan, Dec. 27, 1984, 59-281714; Dec. 27, 1984, 59-281715
Int. Cl.[4] C08F *2/50, 220/56*
U.S. Cl. 522—3 **18 Claims**

1. A process for preparing a particulate water-soluble polymer having a high molecular weight, an excellent water solubility and a uniform particle size which comprises:

(a) adding at least one surfactant selected from the group consisting of a non-ionic surfactant and an anionic surfactant to an at least 20% by weight aqueous solution of a vinyl monomer in an amount of 0.001 to 1% by weight based on the monomer said surfactant being employed in combination with at least one member selected from the group consisting of with at least one member selected from the group consisting of a hypophosphite, a urea compound and an aliphatic tertiary amine,

(b) adjusting the dissolved oxygen in the aqueous monomer solution to at most 1 mg/liter,

(c) admixing the aqueous monomer solution with at most 0.03% by weight of a photopolymerization initiator based on the monomer,

(d) continuously feeding the aqueous monomer solution in the form of a layer having a thickness of 3 to 10 mm onto a moving support located in an atmosphere containing at most 1% by volume of oxygen,

(e) irradiating the layer of the aqueous monomer solution on the moving support with ultraviolet rays having a wavelength of 300 to 450 millimicrons at an intensity of at most 50 W/m^2,

(f) continuously taking out the produced polymer in the form of a sheet having a thickness of 3 to 10 mm from the moving support,

(g) breaking the polymer sheet to cubic pieces of 3 to 10 mm in length of a side by a roller cutter in a wet state,

(h) pulverizing the cubic pieces to particles having a diameter of 0.3 to 3 mm by a vertical cutter in a wet state, and

(i) drying the particles with hot air.

4,612,337
METHOD FOR PREPARING INFECTION-RESISTANT MATERIALS

Charles L. Fox, Jr., Fort Lauderdale, Fla., and Shanta M. Modak, River Edge, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 30, 1985, Ser. No. 739,424
Int. Cl.[4] A61K *31/625*
U.S. Cl. 523—113 **15 Claims**

1. A method of preparing an infection-resistant polymeric material for use on or within a human or animal body which comprises the following sequence of steps:

(a) soaking a polymeric material with a solution of an antimicrobial agent dissolved in an organic solvent therefor,

(b) soaking the polymeric material with an organic solvent for a metal salt,

(c) resoaking the polymeric material with the solution of the antimicrobial agent dissolved in the organic solvent therefor, and

(d) drying the polymeric material after each soaking step.

4,612,338
AMINE CAPPED ALIPHATIC POLYEPOXIDE GRIND RESIN FOR USE IN CATHODIC ELECTROCOAT PROCESSES

Ding-Yu Chung, Farmington Hills; Tapan K. Debroy, Novi, and Michael L. Bartley, Farmington Hills, all of Mich., assignors to BASF Corporation, Inmont Divison, Clifton, N.J.

Filed Apr. 15, 1985, Ser. No. 723,587
Int. Cl.[4] C09D 3/58, 5/44
U.S. Cl. 523—414 10 Claims

1. A resin composition particularly adapted for use as a film-forming composition in a cathodic electrodeposition process, comprising:

a. the reaction product of an aliphatic polyepoxide and a polyether primary amine; and,

b. a pigment,

wherein the pigment and the reaction product are ground together to form a pigment paste, the resin composition has antifoaming properties, high stability, and produces high film build.

4,612,339
HEAT STABILIZED POLYAMIDE COMPOSITIONS

Bruno Giroud-Abel, Ecully, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 8, 1985, Ser. No. 709,793
Claims priority, application France, Mar. 8, 1984, 84 03786
Int. Cl.[4] C08K 3/16, 5/13, 5/11
U.S. Cl. 524—84 17 Claims

1. A composition of matter comprising a polyamide matrix, said matrix having incorporated therein (i) at least one lanthanide or yttrium-based compound other than halides and (ii) at least one ammonium, or alkali or alkaline earth metal halide, in an amount effective to stabilize said polyamide matrix against action by light and heat and against a change in rheological characteristics.

15. A stabilizer composition comprising at least one lanthanide or yttrium based compound comprising (1) a lanthanide or yttrium salt of (i) an aliphatic monocarboxylic acid containing from 2 to 30 carbon atoms or an aliphatic dicarboxylic acid containing from 3 to 30 carbon atoms, either saturated or containing one or more ethylenic double bonds, or a substituted such acid substituted by one or more halogen atoms, hydroxy groups, alkoxy groups containing from 1 to 12 carbon atoms, mercapto groups, phenyl, phenoxy, naphthyl, or cyclohexyl groups, the ring moieties of which optionally being substituted by one or more halogen atoms, hydroxy groups, alkyl groups containing 1 to 6 carbon atoms, or alkoxy groups containing 1 to 6 carbon atoms; (ii) benzoic, 1-naphthoic, 2-naphthoic, cyclopentanecarboxylic, cyclohexanecarboxylic, cyclopentenecarboxylic or cyclohexenecarboxylic acid, the cyclic moieties of which optionally being substituted by one or more halogen atoms, hydroxy groups, alkyl groups containing 1 to 12 carbon atoms, alkenyl groups containing 2 to 12 carbon atoms, alkoxy groups containing 1 to 12 carbon atoms, phenyl, benzyl, phenoxy or cyclohexyl groups, alkoxy-carbonyl groups containing 2 to 24 carbon atoms, or alkenyloxy-carbonyl groups containing 4 to 24 carbon atoms; (iii) an alkylmonoester, the alkyl moiety of which containing 1 to 24 carbon atoms, or alkenyl monoester, the alkenyl moiety of which containing 3 to 24 carbon atoms, of the aliphatic dicarboxylic acids defined above; (iv) a heterocyclic carboxylic acid, or a substituted such acid substituted by one or more halogen atoms, hydroxy groups, alkyl groups containing 1 to 12 carbon atoms, alkoxy groups containing 1 to 12 carbon atoms, alkenyl groups containing 2 to 12 carbon atoms, alkoxycarboxyl groups containing 2 to 24 carbon atoms, or alkenyloxycarbonyl groups containing 4 to 24 carbon atoms; (2) a lanthanide or yttrium phenolate, the cyclic moiety of which optionally being substituted by one or more halogen atoms, alkyl or alkoxy groups containing 1 to 24 carbon atoms, alkenyl groups containing 2 to 24 carbon atoms, phenyl, benzyl, phenoxy or cyclohexyl groups; (3) a lanthanide or yttrium mercaptide; (4) a lanthanide or yttrium chelate of a β-dicarbonyl compound having the general formula (I):

$$R_1—CO—CHR_2—CO—R_3 \quad (I)$$

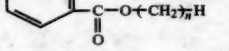
in which R_1 and R_3, which are identical or different, are each a straight or branched chain alkyl group containing 1 to 36 carbon atoms, or such alkyl group substituted by one or more halogen atoms; a straight or branched chain alkenyl group containing 3 to 36 carbon atoms, or such alkenyl group substituted by one or more halogen atoms; an aryl radical or an aryl radical substituted aromatically by one or more of the following substituents: (a) alkyl radicals containing 1 to 6 carbon atoms, or such radicals substituted by one or more halogen atoms, (b) alkenyl radicals containing 2 to 6 carbon atoms, or such radicals substituted by one or more halogen atoms, (c) the nitro group, (d) the —CHO group (e) the —COOH group (f) alkoxy groups containing 1 to 6 carbon atoms, (g) a $—COOR_4$ group, wherein R_4 is an alkyl radical containing 1 to 12 carbon atoms or an alkenyl radical containing 2 to 12 carbon atoms, (h) the OH group, or (i) halogen atoms; an aralkyl radical, the aliphatic moiety of which contains from 1 to 12 carbon atoms and the cyclic moiety of which may be substituted by one or more of the above substituents; a cycloaliphatic radical containing from 5 to 12 carbon atoms and the cyclic moiety of which may contain one or more carbon-carbon double bonds and be substituted by one or more of the above substituents; a concatenation of a plurality of the aforesaid radicals; with the proviso that said aliphatic radicals defined above may contain one or more bridging —O— oxygen atoms, or —S— sulfur atoms, or —CO— carbonyl groups, or —COO— carboxylate groups; and R_2 is a hydrogen atom; or (5) a lanthanide or yttrium oxide, hydroxide, or salt of an inorganic oxygen acid.

4,612,340
MEDICAL DEVICE

Yoshinori Ohachi, 747, Kitamikata, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan

Filed Mar. 2, 1984, Ser. No. 585,859
Claims priority, application Japan, Mar. 9, 1983, 58-37283; Mar. 9, 1983, 58-37284
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—296 21 Claims

1. A radiation sterilized medical device made of a resin compound comprising 100 parts by weight of vinyl chloride resin, 0.001 to 5 parts by weight of at least one metal oxide selected from the group consisting of magnesium oxide, calcium oxide, and zinc oxide and 5 to 200 parts by weight of a dialkyl phthalate of the formula



wherein m and n are each an integer of the value of substantially 6 to 12 and the average of m and n, $(m+n)/2$, is not more than 11.5.

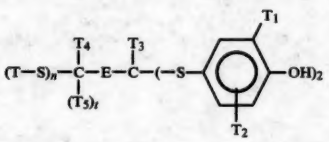
4,612,341
TRI- AND TETRA-(SUBSTITUTED HYDROXYPHENYLTHIO) ALKANE AND CYCLOALKANE STABILIZERS

John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 576,978, Feb. 3, 1984, Pat. No. 4,560,799.
This application Sep. 19, 1985, Ser. No. 777,895
Int. Cl.[4] C08K 5/36
U.S. Cl. 524—331 19 Claims

1. A composition of matter comprising an organic material

subject to oxidative, thermal or photo-degradation selected from the group consisting of synthetic and naturally occuring polymers, oils, waxes and fats stabilized with an effective stabilizing amount of a compound of formula I



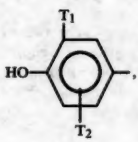
(I)

wherein

T_1 and T_2 are independently alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms,

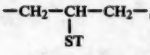
T_2 may also be hydrogen,

T is alkyl of 1 to 24 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, or the group



,

E is a direct bond, alkylene of 1 to 11 carbon atoms, cycloalkylene of 5 to 6 carbon atoms or phenylene, or is the group



T_3 and T_4 are independently hydrogen, alkyl of 1 to 30 carbon atoms, said alkyl substituted by phenyl or by phenyl substituted by alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, or

T_3 and T_4 together are straight- or branched-chain alkylene of 3 to 7 carbon atoms when E is methylene,

T_5 is hydrogen,, alkyl of 1 to 4 carbon atoms or phenyl,

n is 1 or 2, t is 0 or 1, and t is 2−n.

4,612,342

RUBBER COMPOSITIONS CONTAINING SMALL PARTICLE SIZE ZEOLITES

John Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 557,377, Dec. 1, 1983, abandoned, which is a continuation of Ser. No. 349,787, Feb. 18, 1982, abandoned, which is a continuation of Ser. No. 93,345, Nov. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,836, which is a continuation-in-part of Ser. No. 572,122, Jan. 17, 1984, abandoned, which is a continuation of Ser. No. 274,898, Jun. 18, 1981, abandoned, said Ser. No. 274,898, is a continuation-in-part of Ser. No. 189,419, Sep. 22, 1980, abandoned. This application Jun. 11, 1984, Ser. No. 619,445

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—450 **5 Claims**

1. A rubber composition which contains a filler amount of a synthetic zeolite, said zeolite being present in the form of small particles said particles being similar to zeolite A in having the chemical formula of zeolite A but differing from zeolite A in having larger ports or pore diameters, having bimodal pore size distribution, and having an X-ray diffraction pattern depressed from that of a 4 micron zeolite a standard, said particles being formed by the reaction of sodium silicate and sodium aluminate when the preparative batch reaction mixture has a water to sodium oxide molar ratio of between 15:1 and 20:1; a sodium oxide to silica molar ratio of between 1.5:1 and 3.1:1; and a silica to alumina molar ratio of between 1:0:1 and 4.5:1, and wherein the particles exhibit a narrow differential weight percent guassian distribution with an average particle size of no more than about 1.6 microns with at least 90% of the weight between 0.1 and 3.2 microns in diameter, wherein the cumulative percent population exhibits at least 64% by weight less than one micron, with no more than 1% by weight greater than 2.0 microns in diameter, said particles having a surface area of greater than 10 m^2/g.

4,612,343

COLORED POLYMER EMULSION AND PROCESS FOR PREPARATION THEREOF

Shuichi Okuzono, Shinnanyo; Yasuhiro Oda, Tokuyama; Takashi Shintani, Tokuyama, and Noriaki Emura, Tokuyama, all of Japan, assignors to Toya Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,732

Claims priority, application Japan, Jul. 6, 1984, 59-138972

Int. Cl.[4] C08L *43/02*

U.S. Cl. 524—547 **20 Claims**

1. A colored polymer emulsion comprising particles of a copolymer having at least 2×10^{-5} gram-equivalent, per gram of the copolymer, of a phosphoric acid group or a salt thereof, said copolymer particles having an average particle size of not larger than 1 μm and a minimum film-forming temperature of not higher than 35° C. and having been dyed with a basic dye.

4,612,344

FLAME-PROOFED, REINFORCED THERMOPLASTIC POLYESTER MOULDING COMPOSITION CONTAINING XONOTLITE

Franz Breitenfellner, Bensheim, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 472,345, Mar. 4, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,054

Claims priority, application Switzerland, Mar. 16, 1982, 1638/82

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—601 **9 Claims**

1. A reinforced, flame-proofed moulding composition, which consists essentially of

(a) a thermoplastic polyester,

(b) 5 to 30% by weight, based on the total composition, of an organic halogen compound as flame-proofing additive alone or together with a compound of an element of the 5th Main Group of the Periodic Table,

(c) 0.2 to 10% by weight, based on the total composition, of xonotlite,

(d) 5 to 50% by weight, based on the total composition of a reinforcing filler, and

(e) 0 to 10% by weight, based on the total composition of a conventional additive other than poly(vinyl acetate) or ethylene/vinyl acetate copolymer,

wherein the total of components (a) to (e) adds up to 100% by weight of the total composition.

4,612,345

HYDROXYPROPYL METHYL CELLULOSE ETHERS USEFUL AS SUSPENDING AGENTS FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE

Roland H. P. Hess, Au, Switzerland, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 28, 1985, Ser. No. 706,829

Int. Cl.[4] C08K *5/04*; C08L *1/28, 27/06*

U.S. Cl. 524—733 **13 Claims**

1. A process for preparing polymers comprising vinyl chlo-

ride by suspension polymerization of vinyl chloride in the presence of a suspending agent, characterized in that the suspending agent is a hydroxypropyl methyl cellulose having a methoxyl substitution of from 21 percent to 35 percent and a hydroxypropoxyl substitution of from 15 percent to 35 percent.

4,612,346

RESINOUS COMPOSITION

Kazumasa Chiba, Nagoya, and Kiyoji Tanaka, Kagamihara, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

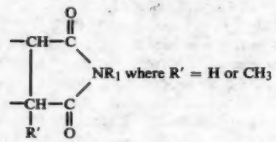
Filed Jun. 13, 1984, Ser. No. 620,148

Claims priority, application Japan, Jun. 14, 1983, 58-106358; Aug. 5, 1983, 58-142510

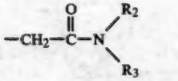
Int. Cl.⁴ C08L 77/00

U.S. Cl. 525—66 **8 Claims**

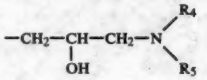
1. A resinous composition comprising (A) from 5 to 98% by weight of a polyamide and (B) from 95 to 2% by weight of a polyolefin modified with from 0.001 to 10% by mole based on all polymer components of a component having at least one functional group selected from the groups represented by the following general formulas (I), (II) and (III):



(I)

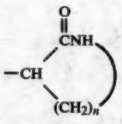


(II)



(III)

wherein R_1, R_2, R_3, R_4 and R_5 in said general formulas (I), (II) and (III) are independently selected from the group consisting of a group represented by the formula:



wherein n denotes an integer of 2 to 10, alkyl groups having 1 to 4 carbon atoms, phenyl group and benyl group.

4,612,347

POLYMER MIXTURES WITH A MAT SURFACE

Herbert Eichenauer, Dormagen; Joachim Döring, Cologne; Karl-Heinz Ott, Leverkusen, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,781

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405938

Int. Cl.⁴ C08L 39/08, 51/04

U.S. Cl. 525—73 **10 Claims**

1. A mixture of

(A) 99.5 to 0.05% by weight of a graft product which is a mixture of 40 to 99.9 parts by weight of styrene, α-methylstyrene, p-methylstyrene, vinyltoluene, methyl methacrylate or mixtures thereof, 40 to 0.1 parts by weight of a monoacid or diacid containing a polymerisable double bond and 0 to 49 parts by weight of acrylonitrile grafted on a rubber in particle form with an average particle diameter (d_{50}) of 0.05 to 20.0 μm and a glass transition temperature of ≦10° C., with a total rubber content of 5 to 80% by weight, and

(B) 0.05 to 99.95% by weight of a thermoplastic resin containing 0.1 to 40% by weight of incorporated units of a basic monomer containing vinyl groups.

4,612,348

RUBBER CONCENTRATE, POLYMER BLENDS BASED THEREON AND METHODS FOR MAKING SAME

Yun C. Sun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1984, Ser. No. 681,397

Int. Cl.⁴ C08L 51/04, 55/02

U.S. Cl. 525—86 **22 Claims**

1. A method for making an impact resistant, ABS rubber reinforced rigid polymer blend comprising:

forming a rubber concentrate by polymerizing an acrylonitrile and styrene monomer system in the presence of a mixture of a low molecular weight rubber having a weight average molecular weight of from about 2,000 to about 50,000 and a higher molecular weight rubber having a weight average molecular weight of from about 100,000 to about 400,000;

blending the rubber concentrate resulting from the foregoing into an ABS polymer blend.

4,612,349

PROCESS FOR CROSSLINKING ETHYLENE POLYMERS CONTAINING ANHYDRIDE FUNCTIONS, CROSSLINKABLE POLYMER COMPOSITIONS AND THE APPLICATION OF THESE COMPOSITIONS TO THE COATING OF SUBSTRATES

Adrien Nicco, Bethune; Jerome Hubert, Paris; Jacques Druz, Strasbourg, and Morand Lambla, Bischheim, all of France, assignors to Societe Chimique des Charbonnages S.A., France

Filed Oct. 29, 1984, Ser. No. 666,228

Claims priority, application France, Oct. 28, 1983, 83 17273

Int. Cl.⁴ C08F 8/08

U.S. Cl. 525—117 **22 Claims**

1. A process for crosslinking a polymer containing structural units derived from ethylene and maleic anhydride comprising the step of reacting a polymer containing from about 42 to 99% by weight of structural units derived from ethylene or from ethylene and at least one α-olefin, from about 1 to 8% by weight of structural units derived from maleic anhydride and from 0 to about 50% by weight of structural units derived from at least one additional monomer selected from an ester of an unsaturated carboxylic acid with an alcohol containing from 1 to 12 carbon atoms, with at least one polyepoxide compound having the formula:

wherein A is a polyfunctional group of valency n≧2 and R is a hydrocarbon, in the presence of at least one catalyst suitable for reacting said anhydride functions with said polyepoxide functions at a temperature of from about 10° to 160° C., under a pressure of from about 1 to 300 bars and for at least about 0.5 hour.

4,612,350

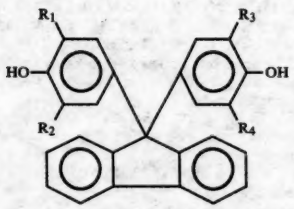
BIS(HYDROXYPHENYL)FLUORENE POLYARYLATE POLYMERS AND ALLOYS

Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

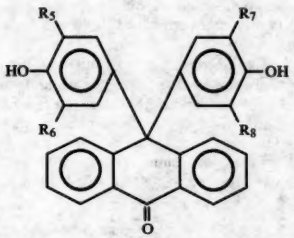
Continuation of Ser. No. 687,061, Dec. 28, 1984, abandoned.
This application Jul. 3, 1985, Ser. No. 752,341
Int. Cl.[4] C08G 63/18
U.S. Cl. 525—177 29 Claims

1. A polyarylate copolymer prepared by reacting

(A) a mixture of a bis(hydroxyphenyl) fluorene compound of the formula



wherein R_1, R_2, R_3 and R_4 are independently hydrogen, lower alkyl of 1 to 4 carbon atoms or phenyl; or a polyarylate-forming derivative thereof; and a bisphenol compound of the formula:



wherein R_5, R_6, R_7 and R_8 are independently hydrogen, lower alkyl of 1 to 4 carbon atoms or phenyl; or a polyarylate-forming derivative thereof; and wherein the molar ratio of bis(hydroxyphenyl)fluorene to bisphenol is from 20:1 to 1:20; and

(B) a mixture of isophthalic and terephthalic acid or polyarylate-forming derivatives thereof, in a molar ratio of 9:1 to 1:9, respectively.

4,612,351

FLUOROELASTOMERIC COMPOSITIONS BASED ON VINYLIDENE FLUORIDE, CONTAINING SMALL AMOUNTS OF CHLOROTRIFLUOROETHYLENE, HAVING A HIGH ADHESION TO METALS IN THE VULCANIZED STATE

Gerardo Caporiccio; Enrico Monza, both of Milan; Piergiorgio Bonardelli, Brescia; Giovanni Moggi, and Gianna Cirillo, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jun. 29, 1984, Ser. No. 626,204
Claims priority, application Italy, Jun. 30, 1983, 21865 A/83; May 23, 1984, 21050 A/84
Int. Cl.[4] C08F 214/22, 214/24, 214/28; C08L 27/16
U.S. Cl. 525—199 4 Claims

1. Vulcanizable fluoroelastomeric compositions having, in the vulcanized state, a high adhesion to metals, comprising a polymer comprising vinylidene fluoride and chlorotrifluoroethylene, said polymer being present as:

I. an elastomeric mixture consisting essentially of:

(A) 1.3 to 30 parts of a copolymer (A) comprising, by weight, from 6% to 81% of chlorotrifluoroethylene; from 18% to 71% of vinylidene fluoride; from 0% to 41% of hexafluoropropene; and from 0 to 49% of tetrafluoroethylene; and

(B) 98.7 to 70 parts by weight of an elastomeric copolymer (B) consisting essentially of, by weight: from 26% to 72% of vinylidene fluoride; from 25% to 44% of hexafluoropropene, and from 0% to 36% of tetrafluoroethylene

II. a fluoroelastomeric copolymer (C) consisting essentially of, by weight, from 37% to 73% of vinylidene fluoride, from 22% to 41% of hexafluoropropene; from 0.6% to 7.5% of chlorotrifluoroethylene; from 0% to 37% of tetrafluoroethylene,

characterized in that the total amount of chlorotrifluoroethylene units is in the range 1% to 10% by weight, calculated on the total.

4,612,352

WATER-SOLUBLE OR WATER-DISPERSIBLE GRAFT POLYMERS, THEIR PREPARATION AND THEIR USE

Paul Schäfer, Riehen; Heinz Abel, Reinach; Christian Guth, Basel, all, Switzerland, and Albert Stehlin, Rosenau, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 509,103, Jun. 30, 1983, abandoned.
This application Nov. 19, 1984, Ser. No. 673,212
Claims priority, application Switzerland, Jun. 7, 1982, 4116/82
Int. Cl.[4] C08G 65/32; C08L 71/02
U.S. Cl. 525—404 24 Claims

1. A water-soluble or water-dispersible graft polymer comprising: (a) as a parent chain an anionic, cationic, amphoteric or non-ionic polyalkylene oxide containing from 2 to 200 —C—C—O— groups; (b) at least one hydrophobic radical bound to said polyalkylene oxide and comprising a straight or branched alkyl or alkenyl chain of 8 to 22 carbon atoms, alkylphenyl containing from 4 to 16 carbon atoms in the alkyl chain, or phenyl substituted with a phenyl group; and (c) at least 20% by weight of hydrophilic graft substituent derived from ethylenically unsturated polymerizable monomers containing hydrophilic groups and grafted onto carbon atoms in said polyalkylene oxide chain.

4,612,353

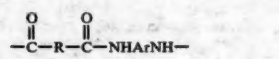
POLYAMIDE/POLYETHERIMIDE ALLOYS

Philip S. Andrews, Hamden, and Kemal Onder, North Haven, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1985, Ser. No. 725,723
Int. Cl.[4] C08L 77/00
U.S. Cl. 525—432 12 Claims

1. A polymer blend which comprises

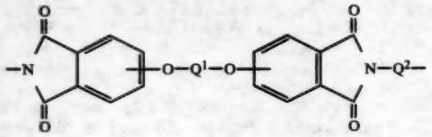
(a) from about 25 to about 75 percent by weight of a polyamide characterized by a recurring unit of the formula:



I

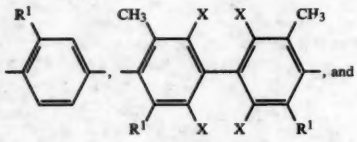
wherein Ar represents arylene and, in about 30 to about 85 percent of the recurring units, R represents alkylene from 6 to 12 carbon atoms, inclusive, and in about 15 percent to about 70 percent of the recurring units R represents m-phenylene; and

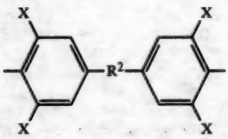
(b) from about 75 to about 25 percent by weight of a polyetherimide characterized by a recurring unit of the formula:



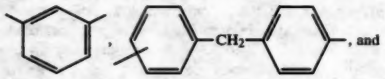
II

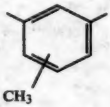
wherein Q^1 is a divalent radical selected from the group consisting of





wherein each R^1 is independently selected from hydrogen or methyl, each X is independently selected from hydrogen or halogen, and R^2 is a straight-chain or branched alkylene containing 1 to 5 carbon atoms; and Q^2 is a divalent radical selected from the group consisting of





4,612,354

METHOD FOR PREVENTING POLYMER SCALE DEPOSITION IN THE POLYMERIZATION OF A VINYLIC MONOMER

Toshihide Shimizu, Urayasu; Yasuo Furukawa, Joetsu, and Ichiro Kaneko, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

PCT No. PCT/JP82/00414, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01452, PCT Pub. Date Apr. 28, 1983

Continuation of Ser. No. 514,810, Jun. 14, 1983, abandoned. This PCT application Oct. 14, 1982, Ser. No. 764,508

Claims priority, application Japan, Oct. 20, 1981, 56-167699

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—62 **7 Claims**

1. A method, in the polymerization of a vinylic monomer in a polymerization reactor, in which the polymerization initiator is an organic peroxide which is soluble in the monomer but has a solubility in water of 0.2% by weight or larger at 20 degrees C., for preventing deposition of polymer scale on the surface of the reactor walls which method comprises

(A) coating the surface of the reactor walls, prior to the introduction of the polymerization mixture into the polymerization reactor, with an aqueous coating solution having a pH of 7 or below and containing

(a) an alkali metal or ammonium salt of a sulfonic acid or carboxylic acid dye or an alkali metal or ammonium salt of an organic sulfonic acid or carboxylic acid having at least one pair of conjugated double bonds in a molecule, and

(b) a polyvinyl alcohol dissolved therein, and

(B) drying the thus coated surface.

4,612,355

PROCESS FOR THE PERFORMANCE OF CHEMICAL REACTIONS, MORE PARTICULARLY FOR THE MANUFACTURE OF PLASTICS BY MEANS OF EXTRUDERS AND APPARATUS FOR THE PROCESS

Roland K. Belz, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to RB Kunststoffpatent- Verwertungs AG, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,296

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3335954

Int. Cl.[4] C08F *2/02*

U.S. Cl. 526—65 **30 Claims**

1. A process for the production of thermoplastic materials from reactant materials by means of chemical reactions in an extruder having individual temperature zones, comprising the steps of:

conveying reactants into a reactor having a discharge nozzle and at least two extruders connected in cascade and interconnected by a damming means, the reactants being conveyed in a reactant stream of the reactants and products thereof;

independently controlling temperatures within at least five temperature zones along the stream, and localizing the formation of a reaction product in a temperature zone;

subjecting the reactant stream to vacuum distillation in a distillation zone along the extruder adjacent said discharge nozzle, and limiting vacuum to said distillation zone by at least one restriction along the reactant stream.

4,612,356

HOMO- AND CO- (ADDITION) POLYMERS OF DI-PERFLUOROALKYL CARBAMYL GROUP CONTAINING (METH) ACRYLATE MONOMERS

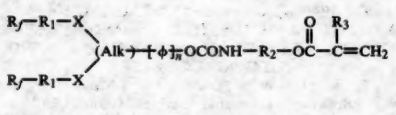
Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 655,833, Oct. 1, 1984, Pat. No. 4,540,805. This application Mar. 11, 1985, Ser. No. 710,638

Int. Cl.[4] C08F *14/18, 28/00*

U.S. Cl. 526—243 **4 Claims**

1. An addition polymer containing homopolymrized or co-polymerized monomer units of the formula



(I)

where

R_f is perfluoroalkyl, omega-hydroperfluoroalkyl, or perfluoroalkoxy substituted perfluoroalkyl;

R_1 is alkylene of up to 12 carbon atoms;

X is —S— or —SO_2—;

Alk is alkanetriyl having from 1 to 12 carbon atoms;

ϕ is phenylene which is unsubstituted or substituted by chlorine, bromine, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;

n is 0 or 1;

R_2 is alkylene of up to 12 carbon atoms; and

R_3 is hydrogen or methyl.

4,612,357

MELT-PROCESSIBLE TETRAFLUOROETHYLENE COPOLYMERS AND PROCESS FOR PREPARING THEM

Paul G. Bekiarian, Claymont, and Paul T. Gilmore, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 9, 1985, Ser. No. 753,276
Int. Cl.[4] C08F *214/16*
U.S. Cl. 526—247 6 Claims

1. A melt-processible, nonelastomeric, thermoplastic non-thermosetting tetrafluoroethylene copolymer resin polymerized from the unsaturated monomers recited below through polymerization of the double bonds, which contains

(a) at least 99.97 weight percent recurring units of tetrafluoroethylene based on weight of (a) and (b),

(b) sufficient recurring units, but not more than 0.03 weight percent based on (a) and (b), of at least one iodo(perfluoroalkyl) (C_1–C_{10}) ethylene of the formula $I(CF_2)xCH{=}CH_2$ where x is a cardinal number of 1–10, to produce at least 0.00005 weight percent iodine, based on weight of (a) and (b),

(c) between 0.5–20 weight percent based on weight of (a), (b) and (c), recurring units of at least one ethylenically unsaturated comonomer of the formula $R_fCF{=}CF_2$ or $R_fOCF{=}CF_2$ or mixtures thereof wherein R_f is perfluoroalkyl of 1–10 carbon atoms,

said copolymer having

(i) a melt tension number of at least 331 micrograms per Pa s,

(ii) an MV^5 of between 10^2 and 10^6 Pa s at the processing temperature of the copolymer.

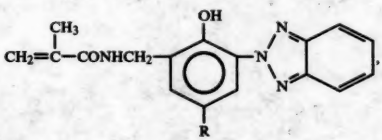
4,612,358

UV-ABSORBING MONOMER AND POLYMERS THEREOF

Siegmund Besecke, Seeheim-Jugenheim; Ralf Liebler, Darmstadt; Heinz-Jürgen Hohage, Muehltal, and Guenter Schroeder, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,660
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439483
Int. Cl.[4] C08F *20/58*
U.S. Cl. 526—259 6 Claims

1. A method for making an ultra-violet-absorbing copolymer which comprises free radically polymerizing at least 0.05 part by weight of a compound of the formula



wherein R is alkyl having from 4 to 12 carbon atoms not more than 6 of which are present in an unbranched chain, with up to 99.95 parts by weight of at least one other vinyl or vinylidene monomer.

4,612,359

ESTERIFIED POLYCYANATE COMPOSITIONS AND THERMOSET RESINS THEREOF

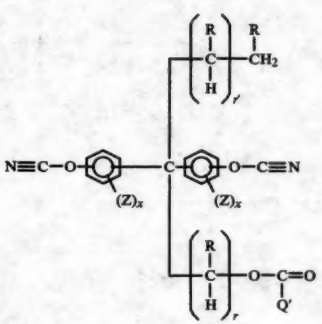
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 714,645, Mar. 21, 1985, abandoned. This application Oct. 16, 1985, Ser. No. 787,938
Int. Cl.[4] C08G *83/00*
U.S. Cl. 528—97 14 Claims

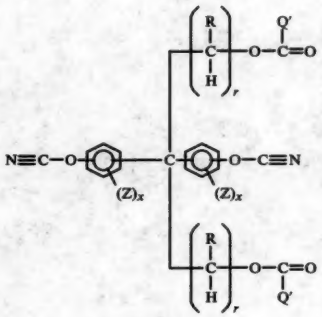
1. A thermosettable composition which comprises

(A) from about 0.1 to 100 percent by weight (pbw) of the combined weight of components (A), (B) and (C) of at least one esterified aromatic cyanate represented by the formulas I, II, III, IV or V

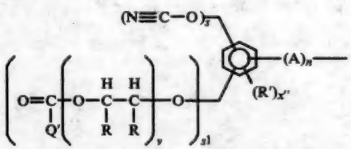
(I)

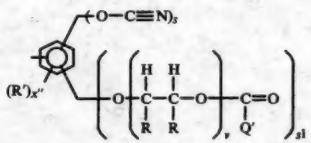


(II)

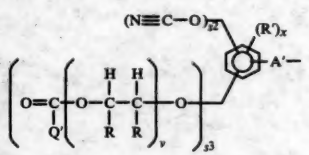


(III)





(IV)



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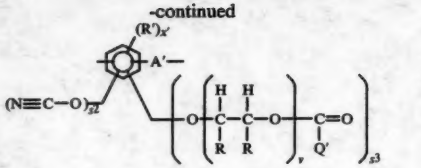
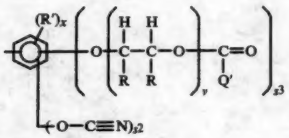
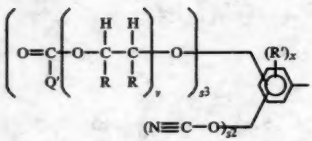
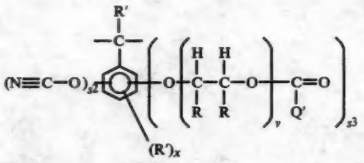
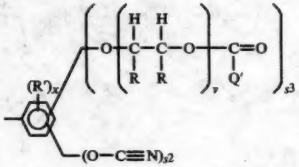




(V)

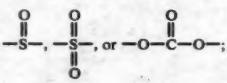






wherein each Q' is a saturated or unsaturated hydrocarbyl group containing from about 2 to about 36 carbon atoms; each A is independently a divalent hydrocarbon group having from 1 to about 10 carbon atoms, —O—,

—S—, —S—S—,



each A' is independently a divalent hydrocarbon group having from 0.001 to about 6 carbon atoms or a

group; p has a value of from zero to about 10; each R' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms or halogen; each Z is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine, bromine or a —O—C≡N group; each R is independently hydrogen or a methyl group; n has a value of zero or 1; n' has a value from 0.001 to about 6; x has a value of 4; x' has a value of 3; x'' has a value of 4 when $s+s^1$ has a value of 1 per each aromatic ring; x'' has a value of 3 when $s+s^1$ has a value of 2 per each aromatic ring; r has a value from 1 to about 36; r' has a value from zero to about 36; v has a value from 1 to about 10; s has a value from about 0.1 to about 0.99 when $s+s^1$ has a value of 1 per each aromatic ring; s^1 has a value from zero to about 0.9 when $s+s^1$ has a value of 1 per each aromatic ring with the proviso that s^1 on at least one ring is not zero; s has a value from about 0.1 to about 1.99 when $s+s^1$ has a value of 2 per each aromatic ring; s^1 has a value from about zero to about 1.9 when $s+s^1$ has a value of 2 per each aromatic ring with the proviso that s^1 on at least one ring is not zero; s^2 has a value from about 0.1 to about 0.99 when s^2+s^3 has a value of 1 per each aromatic ring and s^3 has a value from about zero to about 0.9 when s^2+s^3 has a value of 1 per each aromatic ring with the proviso that s^3 on at least one ring is not zero;

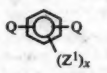
(B) from zero to about 99.9 pbw of the combined weight of components (A), (B) and (C) of

(1) an aromatic polycyanate,

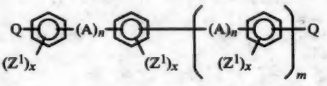
(2) an aromatic polycyanamide or

(3) any combination thereof represented by the formulas VI, VII, VIII or IX

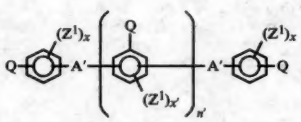
(VI)



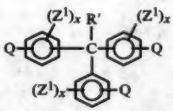
(VII)



(VIII)



(IX)

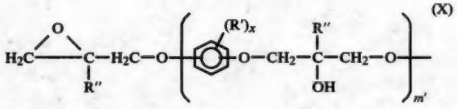


wherein each A, A', R', x, x', n and n' are as above defined; each Q is independently a —O—C≡N or

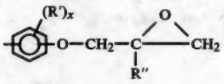
group; each Z^1 is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine, bromine, a —O—C≡N group or a

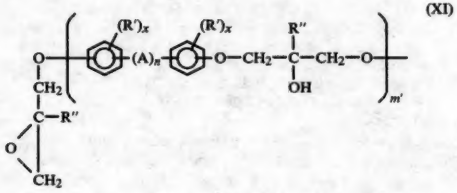
group and m has a value from zero to about 100; and

(C) from zero to about 99.9 pbw of the combined weight of components (A), (B) and (C) of an epoxy resin having an average of more than one vicinal epoxide group per molecule or mixture of such epoxy resins represented by the formulas X, XI, XII or XIII

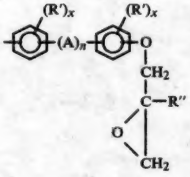


(X)

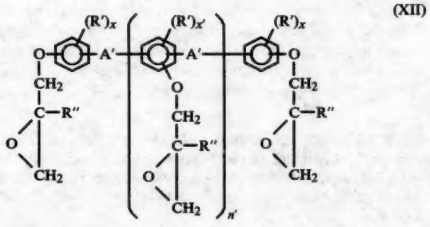




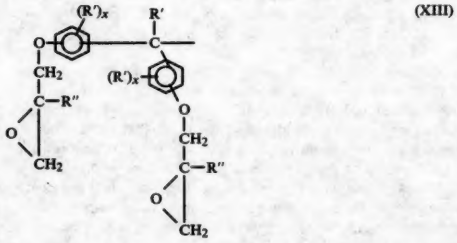
(XI)



(XII)



(XIII)



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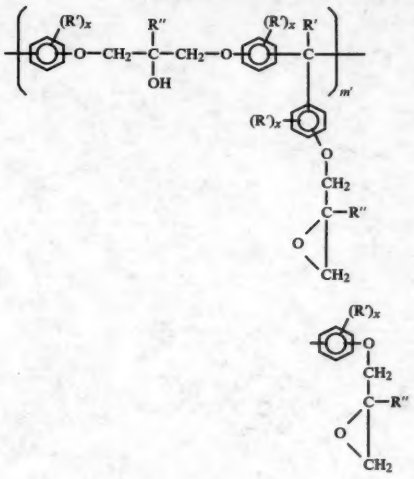


wherein each A, A', R', x, x', n and n' are as above defined; each R'' is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms and m' has a value from zero to about 40.

4,612,360

MELT POLYMERIZATION PROCESS FOR PREPARING POLYARYLATES

Morris R. Ort, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 11, 1985, Ser. No. 786,785

Int. Cl.[4] C08G *63/30*

U.S. Cl. 528—182 **23 Claims**

1. A melt polymerization process for preparing a polyarylate wherein a diester of a dihydric phenol is condensed with an aromatic dicarboxylic acid in the presence of a catalytically effective amount of a catalyst system comprising an imidazole of pKa > 5.

4,612,361

POLY(ETHERIMIDES) AND COMPOSITIONS CONTAINING THE SAME

Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Sep. 23, 1985, Ser. No. 779,253

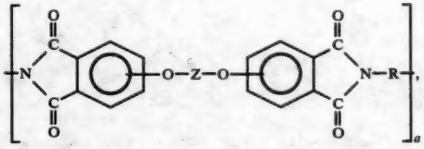
Int. Cl.[4] C08G *73/10*

U.S. Cl. 528—185 **10 Claims**

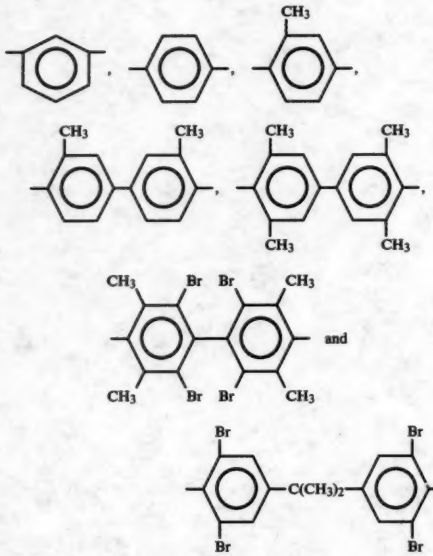
1. A polyetherimide of the formula

$$[A]_m[B]_{1-m}$$

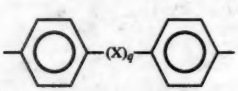
where m is a number greater than 0 and smaller than 1, where A units are of the formula:



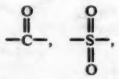
where —O—Z—O— is in the 3 or 3'- and 4 or 4'- positions and Z is a member of the class consisting of (1)



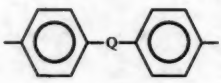
and (2) divalent organic radicals of the general formula:



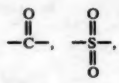
where X is a member selected from the class consisting of divalent radicals of the formulas, C_yH_{2y},



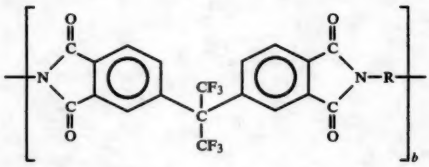
—O— and —S—, where q is 0 or 1, y is a whole number from 1 to 5, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of —O—,



—S—, and $—C_xH_{2x}—$, and x is a whole number from 1 to 5 inclusive, and where the B units are of the formula:



where R is a divalent organic radical as previously defined, and independently a and b represent a whole number in excess of 1.

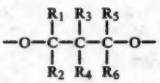
4,612,362

THERMOTROPIC POLYESTER-CARBONATES CONTAINING 2,2-DIMETHYL-1,3-PROPANEDIOL

Yu-Chin Lai, Whippany; Bruce T. DeBona, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, N.J.

Filed Mar. 27, 1985, Ser. No. 716,312
Int. Cl.[4] C08G *63/64*
U.S. Cl. 528—190 **17 Claims**

1. A poly(ester carbonate) polymer comprising aromatic diacyl moieties, cyclic and aliphatic dioxy moieties and carbonate moieties, from about 10 to about 50 mole percent of said dioxy moieties are aliphatic moieties of the formula:



wherein:

R_1, R_2, R_5 and R_6 are the same or different and are hydrogen or alkyl; and

R_3 and R_4 are the same or different and are alkyl; and the remainder of said dioxy moieties are cyclic moieties and said aliphatic and cyclic dioxy moieties in amounts such that said polymer exhibits thermotropic properties.

4,612,363

PROCESS FOR THE PRODUCTION OF POLYESTER

Isao Sasaki; Hiroshi Mori, and Masaharu Fujimoto, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd. and Research Association for Synthetic Fiber Technology, both of, Japan

Filed Nov. 19, 1985, Ser. No. 799,758
Claims priority, application Japan, Nov. 20, 1984, 59-243378
Int. Cl.[4] C08G *63/04, 63/22*
U.S. Cl. 528—274 **9 Claims**

1. A process for producing polyester comprising at least 80% of an ethylene terephthalate repeating unit using as a starting material an ester compound made mainly of terephthalic acid and ethylene glycol or an oligomer thereof, wherein an oligomer having an intrinsic viscosity [η] of not more than 0.4 dl/g and a carboxyl terminal group concentration [COOH] of not more than $90\times[\eta]^{-0.4}$ μeq/g is fed to a final polymerization reactor and polymerized in an inert gas stream or under reduced pressure in the form of a molten thin film having a thickness of from 0.005 to 0.15 mm.

4,612,364

METHOD FOR PRODUCING FORMED PRODUCT OF HIGH MOLECULAR COMPOUNDS

Masaki Yamamoto, and Shigeyuki Takada, both of Osaka, Japan, assignors to Takeda Chemical Industries, Osaka, Japan

Filed Sep. 25, 1985, Ser. No. 779,975

Claims priority, application Japan, Oct. 5, 1984, 59-210197; Sep. 5, 1985, 60-197470

Int. Cl.[4] C08G 63/70

U.S. Cl. 528—491 9 Claims

1. A method for producing a formed product of a high molecular compound which is substantially free of halogenated solvent, which comprises mixing

(a) a high molecular compound having a glass transition temperature of not more than about 60° C.,

(b) a halogenated solvent with 1–6 halogen atoms of the class consisting of halogenated methane, halogenated ethane, ethyl chloride, ethylene chloride, ethylidene chloride, trichloroethylidene, allyl chloride, isopropyl chloride and butyl chloride, and

(c) an organic solvent other than the halogenated solvent which is compatible with the halogenated solvent and is less apt to dissolve the said high molecular compound, to prepare a solution of the high molecular compound and then maintaining the high molecular compound, to boiling point of the halogenated solvent so as to remove the halogenated solvent.

4,612,365

MEDICAMENTS CONTAINING ALPHA 1-THYMOSIN AND HAVING AN IMMUNO REGULATORY ACTION AND ALPHA 1-THYMOSIN FRAGMENTS

Christian Birr, Leimen-St. Ilgen; Ulrich Stollenwerk, deceased, late of Heidelberg; Paul Stollenwerk, heir; Margot Stollenwerk, heir, both of Düren, and Ilona Werner, Heidelberg, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foederung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 133,708, Mar. 25, 1980, Pat. No. 4,470,926, and a continuation-in-part of Ser. No. 490,210, May 6, 1983, abandoned, and a continuation-in-part of Ser. No. 337,961, Jan. 8, 1982. This application Apr. 2, 1984, Ser. No. 595,730

Int. Cl.[4] C07K 7/48, 5/10, 7/06, 7/08

U.S. Cl. 530—301 10 Claims

1. A thymosin alpha-1 fragment selected from the group consisting of

1 2 3 4 5 6 (fragment I)
Ser—Asp—Ala—Ala—Val—Asp;

7 8 9 10 11 12 (fragment II)
Thr—Ser—Ser—Glu—Ile—Thr;

13 14 15 16 17 18 19 (fragment III)
Thr—Lys—Asp—Leu—Lys—Glu—Lys;

20 21 22 23 24 (fragment IV)
Lys—Glu—Val—Val—Glu;

(fragment VI)

20 21 22 23 24 25 26 27 28
Lys—Glu—Val—Val—Glu—Glu—Ala—Glu—Asn;

13 14 15 16 17 18 19 20 (fragment VII)
Thr—Lys—Asp—Leu—Lys—Glu—Lys—Lys—
21 22 23 24 25 26 27 28
—Glu—Val—Val—Glu—Glu—Ala—Glu—Asn;

7 8 9 10 11 12 13 14 (fragment VIII)
Thr—Ser—Ser—Glu—Ile—Thr—Thr—Lys—
15 16 17 18 19 20
—Asp—Leu—Lys—Glu—Lys—Lys—

-continued

21 22 23 24 25 26 27 28
—Glu—Val—Val—Glu—Glu—Ala—Glu—Asn;

and

1 2 3 4 5 6 (fragment IX)
Ser—Asp—Ala—Ala—Val—Asp—
7 8 9 10 11 12
Thr—Ser—Ser—Glu—Ile—Thr;

or said fragments I to IX with an acyl group having 1 to 6 carbon atoms at their N-terminus, and/or said fragments having glutamic acid residues **10**, **21**, **24**, **25** and **27**, aspartic acid residue **15** and asparagine residue **28** present as acid, amide or alkyl amide with 1 to 6 carbon atoms in the alkyl group or as diamide or as dialkyl amide with 1 to 6 carbon atoms in the alkyl groups.

4,612,366

CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

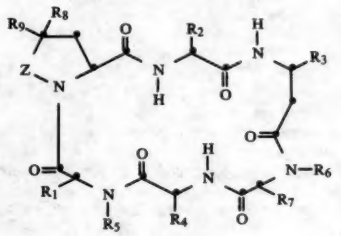
Ruth F. Nutt, Green Lane, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 17, 1985, Ser. No. 745,459

Int. Cl.[4] C07K 7/26; A61K 37/24

U.S. Cl. 530—311 12 Claims

1. A compound having the formula:



wherein

Z is $(CH_2)_n$ and n is 1 or 2;

R_1 and R_2 are independently lower alkyl, benzyl, naphthylmethyl, indolylmethyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5- or 6-membered heterocyclic ring;

R_3 is 3-indolylmethyl, naphthylmethyl, or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;

R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro;

R_5 and R_6 are independently hydrogen or methyl;

R_7 is aminocyclohexylmethyl, aminomethybenzyl or

wherein Y is $(CH_2)_m$ and m is 0, 1 or 2 or sulfur such that the sulfur may be in any position along the chain;

R_8 and R_9 are independently hydrogen, loweralkyl, heteroalkyl wherein the heteroatom is oxygen, sulfur or nitrogen, hydroxy, and alkanoyl, up to 20 carbon atoms, derivatives of the hydroxy mercapto and amino groups, mercapto and amino, provided that R_8 and R_9 are not simultaneously hydrogen.

4,612,367

PROCESS FOR PURIFYING GROWTH HORMONE-LIKE MATERIALS

Edward L. Grinnan, Carmel, and Edward E. Logsdon, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 8, 1985, Ser. No. 720,642
Int. Cl.[4] C07K *3/12, 3/18, 3/20*
U.S. Cl. 530—399 17 Claims

1. A process for separating impurities from an impure mixture containing growth hormone-like material with substantially complete recovery of said growth hormone-like material, which comprises:

(1) applying a complex, impure mixture obtained, without purification, as a result of recombinant DNA expression of a growth hormone-like material to a reverse phase macroporous acrylate ester copolymer resin support at a pH of from about 7 to about 9; and

(2) eluting said growth hormone-like material from said support with an aqueous eluant having a pH of from about 7 to about 9 and containing from about 20% to about 80% by volume of an organic diluent selected from the group consisting of acetone, acetonitrile, and a combination of acetone and acetonitrile.

4,612,368

PROCESS FOR PREPARING 2,2'-AZOBIS(2-METHYLBUTANENITRILE)

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 3, 1981, Ser. No. 272,580
Int. Cl.[4] C07C *107/02;* C08F *2/04, 2/24, 2/28*
U.S. Cl. 534—578 5 Claims

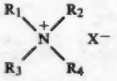
1. A process for the preparation of 2,2'-azobis(2-methylbutanenitrile) comprising:

(a) reacting at a temperature of from −10° C. to 30° C.;

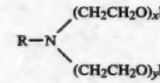
(i) 2-amino-2-methylbutanenitrile;

(ii) a 5 to 10% by weight aqueous metal hypochlorite solution having at least 10 g excess base per liter;

(iii) at least 0.4% by weight based on the butanenitrile of a quaternary ammonium compound of the formula:



wherein R_1, R_2, R_3 and R_4 are alkyl groups with 1–14 carbon atoms, with at least two alkyl groups having 6–14 carbon atoms with the total number of carbon atoms in $R_1+R_2+R_3+R_4$ from 16 to 30 and X is chloride bromide, hydroxide, acetate, formate or any other anionic group which does not deleteriously affect the performance of the quaternary ammonium cation, and at least 0.1% by weight based on the butanenitrile of a nonionic compound of the formula:



wherein R is an alkyl group with 8–20 carbon atoms, $x+y=25$–65 and HLB=16–30; the equivalent ratio of (ii) to (i) being from 1.15:1–1.8:1 and the ratio of the weight of the quaternary ammonium compound to the weight of nonionic compound being from 0.5:1 to 20:1;

(b) recovering the 2,2'-azobis(2-methylbutanenitrile) produced.

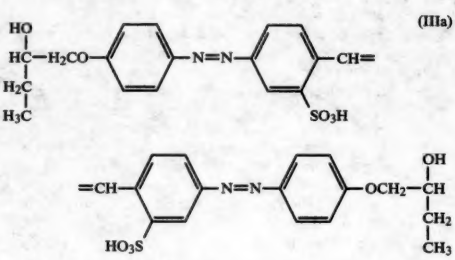
4,612,369

DISAZO 4,4'-DIAMINOSTILBENE-2,2'-DISULFONIC ACIDS DYE

Alfred Fasciati, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 228,657, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 49,815, Jun. 18, 1979, abandoned. This application Jan. 31, 1983, Ser. No. 462,505
Claims priority, application Switzerland, Jun. 30, 1978, 7164/78
Int. Cl.[4] C09B *32/215, 56/04;* D06P *1/06, 3/24*
U.S. Cl. 534—689 1 Claim

1. A disazo dye of the formula



4,612,370

LIPID-SACCHARIDE REACTION PRODUCTS

C. Anthony Hunt, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 364,919, Apr. 2, 1982, Pat. No. 4,425,334. This application Dec. 7, 1983, Ser. No. 558,847
Int. Cl.[4] C07J *17/00;* C07H *11/04*
U.S. Cl. 536—5 1 Claim

1. A composition of matter consisting of the reaction product of a lipid or phospholipid selected from the group consisting of phosphatidyl ethanolamine, phosphatidic acid, cholesterol, and phosphatidyl alkanolamine, and a polysaccharide or oligosaccharide selected from the group consisting of sucrose, inulin, malabiose, raffinose, and dextran.

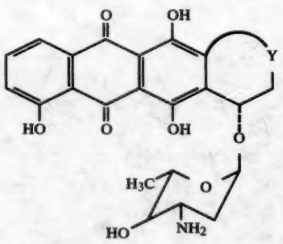
4,612,371

ANTHRACYCLINE ANTIBIOTICS

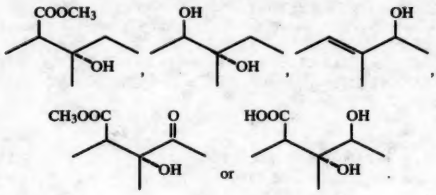
Akihiro Yoshimoto; Shizuka Fujii; Katsuro Kubo, all of Fujisawa; Tomoyuki Ishikura, Chigasaki; Tsutomu Sawa, Ayase; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,876
Claims priority, application Japan, Jul. 25, 1984, 59-155950
Int. Cl.[4] C07H *15/24*
U.S. Cl. 536—6.4 6 Claims

1. An anthracycline antibiotic represented by formula:



wherein Y represents a group shown by:



4,612,372

TYLOSIN DERIVATIVES

Takeo Yoshioka, Ayase; Miharu Maeda, Yokohama; Rokuro Okamoto, Fujisawa; Yasutaka Shimauchi, Ninomiya; Tomoyuki Ishikura, Chigasaki; Tsutomu Sawa, Ayase; Tomio Takeuchi, and Hamao Umezawa, both of Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

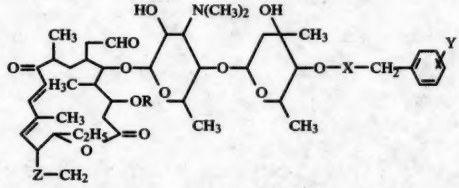
Filed Jul. 12, 1985, Ser. No. 754,568

Claims priority, application Japan, Jul. 20, 1984, 59-151884; Dec. 10, 1984, 59-261536

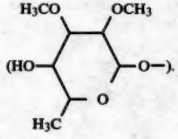
Int. Cl.[4] C07H *17/08*

U.S. Cl. 536—7.1 4 Claims

1. A tylosin derivative represented by formula:



wherein R represents a hydrogen atom, an acetyl group or a propionyl group; X represents a group —CO— or —SO_2—; Y represents a fluorine atom, an acetyl group, a methanesulfonyl group, a methylthio group, a benzoyl group or a methoxy group bound to the benzyl group at the 2-position or 4-position; and Z represents a D-mycinose residue:



4,612,373

TRICHLORO, 6-SUBSTITUTED SUCROSE COMPOUNDS, COMPOSITIONS AND USES THEREFOR

Riaz A. Khan, Sonning; Khisar S. Mufti, Reading, and Gita D. Patel, Tadley, all of England, assignors to Tate & Lyle Public Limited Co., England

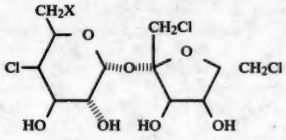
Filed Sep. 12, 1983, Ser. No. 531,604

Claims priority, application United Kingdom, Sep. 13, 1982, 8226058; Jun. 24, 1983, 8317238

Int. Cl.[4] A61K *7/16;* A23L *1/09;* C07H *5/02*

U.S. Cl. 536—120 9 Claims

1. A compound of the formula:



I

(in which X represents a hydrogen atom or a lower alkoxy or phenalkyloxy group).

4,612,374

TRIS-AZETIDINEDIONE DERIVATIVE 1,3,5-TRIAZIN-2,4,6-TRIONES

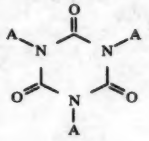
Shenghong A. Dai, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 608,005, May 7, 1984, Pat. No. 4,576,747. This application Dec. 20, 1985, Ser. No. 811,855

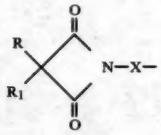
Int. Cl.[4] C07D *403/14*

U.S. Cl. 544—222 5 Claims

1. An azetidinedione-isocyanurate having the formula



wherein each A represents the group



wherein R and R_1, when taken individually, are independently selected from the group consisting of hydrogen and hydrocarbyl of 1–18 carbon atoms, and, when taken together with the carbon atom to which they are attached, represent a cycloalkane residue having 4 to 6 ring carbon atoms, inclusive, and X is a divalent hydrocarbon radical of 2–36 carbon atoms.

4,612,375

SUBSTITUTED 4-HYDRAZINO-PYRIMIDES AS INTERMEDIATES FOR TRIAZOLO [4,3-C]PYRIMIDINES

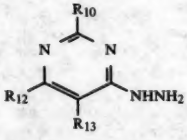
James J. Wade, St. Paul, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 490,842, May 2, 1983, Pat. No. 4,532,242. This application May 8, 1985, Ser. No. 731,872

Int. Cl.[4] C07D *239/24;* A61K *31/505*

U.S. Cl. 544—311 1 Claim

1. A compound of the formula



wherein R_{10} is hydrogen, lower alkyl, lower alkylthio or benzylthio; R_{12} is hydrogen, lower alkyl, halogen, phenyl, N-

(lower alkyl)amino, N,N-di(lower alkyl)amino, lower alkylthio or benzylthio; and R_{13} is hydrogen, lower alkyl, halogen or phenyl; with the provisos that at least one of R_{10} and R_{12} is lower alkylthio or benzylthio, or R_{12} is N-(lower alkyl)amino or N,N-di(lower alkyl)amino; and when R_{10} is lower alkylthio, R_{12} is lower alkylthio or phenyl, or R_{13} is chloro, fluoro or phenyl, or R_{12} is lower alkylthio or phenyl and R_{13} is chloro, fluoro or phenyl.

4,612,376

SUBSTITUTED-3,4-DIHYDRO-4-(2,4,6-TRIMETHOXYPHENYLIMINO)-2(1H)-PYRIMIDONES USEFUL AS CARDIOTONIC, ANTIHYPERTENSIVE, CEREBROVASCULAR VASODILATOR AND ANTI-PLATELET AGENT

Takao Takaya, Kawanishi; Masayoshi Murata, Osaka, and Kiyotaka Ito, Ibaragi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

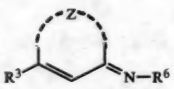
Filed Mar. 12, 1984, Ser. No. 588,902

Claims priority, application United Kingdom, Mar. 25, 1983, 8308290; Jun. 7, 1983, 8315542; Oct. 18, 1983, 8327859

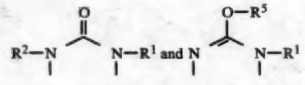
Int. Cl.[4] C07D *239/02*; A61K *31/495*

U.S. Cl. 544—317 **17 Claims**

1. A compound of the formula:



wherein Z is a group selected from



in which R^1 and R^2 are each hydrogen or C_1–C_6 alkyl and R^5 is C_1–C_6 alkyl, R^3 is phenyl or phenyl substituted with mono-, di- or tri-C_1–C_6 alkyl, or with mono-, di- or tri-C_1–C_6 alkoxy, or with mono- or di-halogen, R^6 is phenyl substituted with mono-, di- or tri-C_1–C_6 alkyl, or with mono-, di- or tri-C_1–C_6 alkoxy, or with mono- or di-hydroxy, or with mono- or di-halogen, or with halogen and C_1–C_6 alkyl, and pharmaceutically acceptable salts thereof.

14. A cardiotonic pharmaceutical composition comprising an effective cardiotonic amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

15. An antihypertensive pharmaceutical composition comprising an effective anti-hypertensive amount of a compound of claim 1 in terms of antihypertension in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

16. A cerebrovascular vasodilative pharmaceutical composition comprising an effective cerebrovascular vasodilative amount of a compound of claim 1 in terms of cerebrovascular vasodilation in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

17. An anti-platelet aggregation pharmaceutical composition comprising an effective anti-platelet aggregation amount of a compound of claim 1 in terms of anti-platelet aggregation in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,612,377

PREPARATION OF 2-CHLORO-5-METHYLPYRIDINE

Robert Osborne, and Kevin D. Bailey, both of Clackmannanshire, Scotland, assignors to Imperial Chemical Industries PLC, London, England

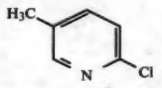
Filed Mar. 14, 1984, Ser. No. 589,232

Claims priority, application United Kingdom, Mar. 30, 1983, 8308822

Int. Cl.[4] C07D *211/72*

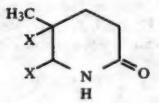
U.S. Cl. 546—345 **5 Claims**

1. A process for the preparation of 2-chloro-5-methylpyridine having the formula (III):



(III)

which comprises contacting a dihalo compound of the formula (I):



(I)

in which X is halogen, with a chlorinating agent selected from the group consisting of phosphorus oxychloride and phosgene at an elevated temperature of 80° to 130° C. in a high boiling chlorinated aromatic hydrocarbon solvent which is liquid at the temperature employed, the chlorinating agent being used in stoichiometric excess, up to 70 mole %, over the dihalo compound (I).

4,612,378

PROCESS FOR THE PREPARATION OF β-(BENZOTHIAZOLYLTHIO)- AND β-(BENZIMIDAZOLYLTHIO)-CARBOXYLIC ACIDS

Hans Bosshard, Basel, and Hans Greuter, Eiken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

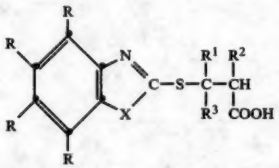
Filed May 14, 1984, Ser. No. 610,145

Claims priority, application United Kingdom, May 14, 1983, 8313321

Int. Cl.[4] C07D *277/70*

U.S. Cl. 548—170 **11 Claims**

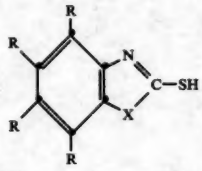
1. A process for the preparation of a compound of the formula I



I

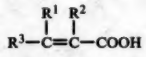
in which X is sulfur or NH, each radical R is the same or different from each other radical R and is hydrogen, alkyl, halogenoalkyl, alkoxy, alkylthio, alkylsulfonyl, phenyl, alkylphenyl, phenylalkyl, cycloalkyl, halogen, —NO_2, —CN, —COOH, —COOalkyl, —OH or a primary, secondary or tertiary amino or carbamyl group and R^1, R^2 and R^3 are all the same or different and are hydrogen, alkyl, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, carboxyalkyl, carboxyl or unsubstituted or substituted aryl or aralkyl, or R^1 and R^2 together are a direct bond or straight-chain or branched alkylene, which

can be substituted by 1 or 2 carboxyl groups, by reaction of a mercaptan of the formula II



II

with an unsaturated carboxylic acid of the formula III



III

or an anhydride thereof, in a strongly acid medium.

4,612,379

PROCESS FOR PRODUCING 1,3-DIOXIN-4-ONE DERIVATIVES

Chikara Kaneko; Masayuki Sato, and Hiromichi Ogasawara, all of Sendai, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jun. 27, 1985, Ser. No. 749,426

Claims priority, application Japan, Jul. 3, 1984, 59-137712

Int. Cl.[4] C07D *319/06*

U.S. Cl. 549—274 **5 Claims**

1. A process for producing 1,3-dioxin-4-one derivatives having a lower alkyl group at 2-position thereof, which process comprises reacting formyl Meldrum's acid with a lower aliphatic carbonyl compound of 2 to 4 carbon atoms in a solvent containing said carbonyl compound at 100° to 120° C., while portionwise adding said acid into said solvent, the total quantity of said acid added being 0.2 mol or less per liter of said solvent.

4,612,380

7-FLUORO-PROSTACYCLIN ANALOGS

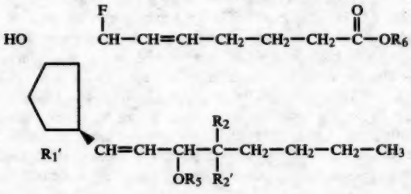
George W. Holland; Perry Rosen, both of North Caldwell, N.J., and Hans Maag, Münchenstein, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 414,765, Sep. 7, 1982, Pat. No. 4,558,142, which is a continuation-in-part of Ser. No. 337,791, Jan. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 242,818, Mar. 11, 1981, abandoned. This application Sep. 9, 1985, Ser. No. 774,210

Int. Cl.[4] C07C *177/00*

U.S. Cl. 549—415 **5 Claims**

1. A compound of the formula:



wherein R_6 is hydrogen or lower alkyl, R_1' is methyl, hydrogen or $—OR_5$; R_2 is hydrogen, methyl or fluoro, R_2' is fluoro, hydrogen, trifluoromethyl or methyl; $—OR_5$ forms a hydrolyzable ether protecting group; with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl.

4,612,381

HETEROCYCLIC COMPOUNDS

John M. Clough, Buckinghamshire, England, assignor to Imperial Chemical Industries PLC, London, England

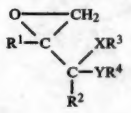
Division of Ser. No. 402,796, Jul. 27, 1982, Pat. No. 4,496,388. This application Oct. 15, 1984, Ser. No. 660,929

Claims priority, application United Kingdom, Aug. 19, 1981, 8125378; Feb. 9, 1982, 8203708; Apr. 1, 1982, 8209705

Int. Cl.[4] C07D *409/06, 407/06, 303/24, 303/34*

U.S. Cl. 549—560 **3 Claims**

1. A compound of the formula (II):



(II)

wherein:

R^1 is C_1–C_4 alkyl, phenyl or phenyl substituted with halo, C_1–C_4 alkoxy, C_1–C_4 alkyl, phenyl, trifluoromethyl or nitro; R^2 is hydrogen or C_1–C_4 alkyl; R^3 and R^4, which may be the same or different, are C_1–C_3 alkyl or allyl, or together form the bridging group $—CH_2—CH_2—CH_2—$ or $—CH(CH_3)—CH_2—CH(CH_3)—$ linking X and Y; and X and Y, which may be the same or different, are oxygen or sulphur except that X and Y are both oxygen or both sulphur when R^3 and R^4 form said bridging group.

4,612,382

PREPARATION OF TRIETHYL DIMETHYL SILOXALANE

Charles G. Russell, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Jun. 27, 1984, Ser. No. 625,226

Claims priority, application United Kingdom, Jul. 5, 1983, 8318207

Int. Cl.[4] C07F *5/06*

U.S. Cl. 556—173 **7 Claims**

1. A process for the preparation of triethyl dimethyl siloxalane comprising the step of admixing octamethylcyclotetrasiloxane with triethyl aluminum at a temperature of from about 170° to about 250° C. for a period of at least about 10 minutes, the molar ratio of triethyl aluminum to octamethylcyclotetrasiloxane being at least about 3.9:1.

4,612,383

METHOD OF PRODUCING POLYSILAZANES

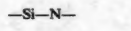
Richard M. Laine, Palo Alto, and Yigal Blum, Menlo Park, both of Calif., assignors to S R I International, Menlo Park, Calif.

Filed Apr. 26, 1985, Ser. No. 727,415

Int. Cl.[4] C07F *7/10*

U.S. Cl. 556—412 **13 Claims**

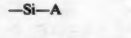
1. A method of preparing polysilazanes having the repeating structure I



I

which comprises:

(a) providing a starting material having the structure II in its molecule



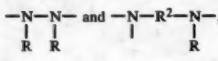
II

in which A is hydrogen, N< or

structure II being part of a linear structure or part of a cyclic structure

(b) providing a catalyst which is effective to activate Si—H, Si—N and/or Si—Si bonds, and

(c) reacting the starting material in the presence of such catalyst with (1) hydrogen where A is nitrogen and structure II is part of a cyclic silazane or (2) with H—X—H in other cases, X being selected from the group >NH, —NR, —NH—NH—,



R being hydrogen or an organic group or a silyl group and R^2 being a bivalent organic group

(d) thereby forming a polymer having the repeating unit

4,612,384

PHOSPHATE MONOESTER ADHESIVE COMPOSITION

Ikuo Omura; Junichi Yamauchi; Yoshinori Nagase, and Fumiko Uemura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

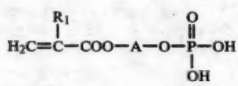
Continuation of Ser. No. 398,437, Jul. 14, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,316

Claims priority, application Japan, Jul. 29, 1981, 56-119536; Jul. 29, 1981, 56-119537; Jul. 30, 1981, 56-120371; Jan. 28, 1982, 57-13038; May 4, 1982, 57-74830; Jan. 14, 1983, 58-4476

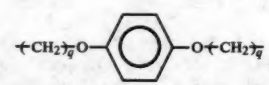
Int. Cl.[4] C07F *9/02*; C08F *4/52*

U.S. Cl. 558—198 **2 Claims**

1. A phosphate monoester of the formula:



wherein R_1 is a hydrogen or a methyl group, and A has the formula:



wherein q is an integer of 2 to 4.

4,612,385

PROCESS FOR THE PREPARATION OF PHENYL N-(2-BIPHENYLYLSULFONYL) CARBAMATE

Junichi Saito, Mitaka, and Tatsuo Tamura, Hamura, both of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

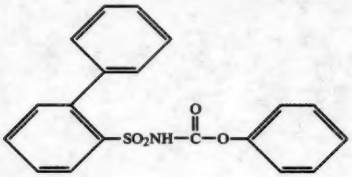
Filed Dec. 3, 1985, Ser. No. 804,207

Claims priority, application Japan, Dec. 6, 1984, 59-256546

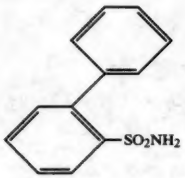
Int. Cl.[4] C07C *143/83*

U.S. Cl. 560—12 **10 Claims**

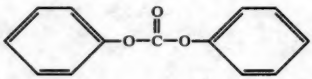
1. In the production of phenyl N-(2-biphenylylsulfonyl) carbamate of the formula



by reacting 2-phenylbenzene sulfonamide of the formula



with diphenyl carbonate of the formula



in the presence of a base and a solvent, the improvement which comprises effecting the reaction in the presence of an alkali metal hydroxide and an aprotic solvent at a temperature between about 20° C. and about 60° C.

4,612,386

PROCESS FOR MAKING ESTERS

James M. Renga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 187,690, Sep. 16, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,704

Int. Cl.[4] C07C *67/14*; C07D *265/30, 213/803, 213/55, 209/42, 277/62, 277/68, 307/18*

U.S. Cl. 560—86 **15 Claims**

1. A process for making an ester having the formula $R''_m(CO_2)_{mn}R_n$ which comprises contacting a carbonate ester of the formula $R(OCO_2R')_m$ with a carboxylic acid halide of the formula $R''(COX)_n$, wherein R singly is an aliphatic, cycloaliphatic, aromatic, or heterocyclic group having a valence of m, R'' singly is a group as defined by R, X, XC(O)—or RO_n and has a valence of n, and R and R'' jointly may be covalently bonded together, R' is a group of up to 4 carbons selected from the group consisting of alkyl, alkenyl, and halogenated derivatives thereof, m and n are each an integer from one to three, and X is Cl, Br, or I, in the presence of a catalytic amount of an acid selected from the group consisting of mineral acids, organic acids, Lewis acids and acidic ion-exchange materials; a base selected from the group consisting of amines, alkali metal hydroxides, and alkali metal carbonates; a salt selected from the group consisting of sulfate, nitrate, phosphate, halide, formate, acetate, benzoate, phenate and bisphenate salts of alkali metals, alkaline earth metals, metals of Groups Ib, IIb or VIII of the Periodic Table and ammonium, sulfonium, sulfoxonium or phosphonium quaternary ions or a compound capable of forming in situ a catalytic amount of an above-defined acid, base or salt at about 25° C.–250° C.

4,612,387

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

David Feitler, Whitehall, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 4, 1982, Ser. No. 336,820
Int. Cl.[4] C07C 1/20, 51/12, 67/36
U.S. Cl. 560—232 20 Claims

1. A method for the production of monocarboyxlic acids and esters which comprises contacting carbon monoxide with a monohydric alcohol containing 1 to 4 carbon atoms in the presence of a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 6 and a constraint index in the approximate range from 1 to 12, which zeolite does not have rhodium metal dispersed on its surface, in the absence of a halide promoter, under a pressure of at least one atmosphere and at a temperature sufficient to effect a reaction between the carbon monoxide and the alcohol to produce a monocarboxylic acid or ester.

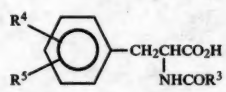
4,612,388

PROCESS FOR PRODUCING N-ACYLPHENYLALANINES

Ryuichi Mita; Toshio Katoh, both of Kawasaki; Chojiro Higuchi, and Akihiro Yamaguchi, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,300
Claims priority, application Japan, Apr. 10, 1984, 59-69999
Int. Cl.[4] C07C 99/06
U.S. Cl. 562—443 15 Claims

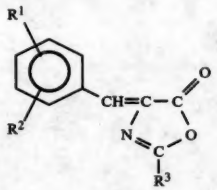
1. A process for producing an N-acylphenylalanine compound of formula (II):



(II)

wherein R^4 and R^5 independently of each other are hydrogen, an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, halogen, hydroxyl, or aryloxy, or together form a methylenedioxy group, and R^3 is methyl or phenyl, which comprises:

(a) hydrolyzing a 2-substituted-4-(substituted)benzylidene-5-oxazolone compound of formula (I):



(I)

wherein R^1 and R^2 independently of each other are hydrogen, an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, halogen, acyloxy or aryloxy, or together form a methylenedioxy group, and R^3 is as defined above, with alkali in an aqueous medium;

(b) adjusting the pH of the aqueous reaction solution containing the hydrolysis product with acid to within the range of 5–9;

(c) adding a platinum or palladium reducing catalyst to the pH adjusted aqueous solution; and

(d) subjecting the hydrolysis product in said resultant reaction solution to catalytic reduction, thereby producing said N-acylphenylalanine product.

4,612,389

TREATMENT OF WASTE STREAM FROM PENTAERYTHRITOL MANUFACTURE

Frank Gupton, Virginia Beach, Va., and Harry E. Ulmer, Morristown, N.J., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 322,555, Nov. 18, 1981, abandoned. This application May 10, 1982, Ser. No. 376,933
Int. Cl.[4] C07C 29/78, 29/86, 31/24, 51/43, 51/47, 51/48, 53/06
U.S. Cl. 562—513 6 Claims

1. A process for recovering inorganic and organic values from an aqueous waste stream derived from pentaerythritol production in which formaldehyde is reacted with acetaldehyde in the presence of a metal hydroxide catalyst, wherein said aqueous stream contains metal formate, pentaerythritol and organic byproducts, said process comprising (1) passing the aqueous waste stream through a macroreticular acrylic ester resin bed to remove organic byproducts and provide a purified aqueous waste stream; (2) evaporatively. crystallizing the purified aqueous waste stream to form crystalline metal formate and a concentrated aqueous mother liquor; (3) separating and recovering the crystalline metal formate as a product from the concentrated aqueous mother liquor, and diluting the said mother liquor with water-miscible alkanol to form a precipitated pentaerythritol-metal formate crystalline mixture and an aqueous alkanolic mother liquor; (4) separating the pentaerythritol-metal formate crystalline mixture from the aqueous alkanolic mother liquor; and (5) contacting said crystalline mixture with a portion of the original aqueous waste stream to dissolve selectively the crystalline metal formate and form a metal formate-enriched aqueous waste stream, and yield undissolved crystalline pentaerythritol as a product.

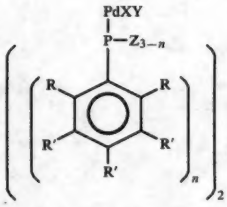
4,612,390

METHOD FOR PRODUCING BRANCHED CARBONYLATION PRODUCTS FROM ALPHA UNSATURATED OLEFINS

Wilfred P. Shum, Swarthmore, and John F. White, Villanova, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 24, 1982, Ser. No. 361,311
Int. Cl.[4] C07C 51/14, 67/38
U.S. Cl. 562—522 14 Claims

1. A process for making branched carboxylic acids or esters which comprises reacting an alpha unsaturated olefin containing between 3 and 24 carbon atoms with carbon monoxide and water or a primary or secondary alcohol in the presence of a catalytic amount of a catalyst composed of a palladium compound having the formula:



wherein n is 1, 2 or 3;

where R is selected from hydrogen, methoxy; and trifluoromethyl, with the provisos that at least one R is not hydrogen and when an R group is methoxy, n equals 3, and in each of the phenyl rings attached directly to phosphorus, one R group is methoxy and the other R group is hydrogen;

where each R′ is selected from lower alkyl of 1 to 5 carbon atoms; lower alkoxy of 1 to 5 carbon atoms; fluorine; chlorine; phenyl or naphthyl, cyano; nitro; fluoro alkyl of 1 to 5 carbon atoms; chloroalkyl of 1 to 5 carbon atoms;

dialkyl amino of 1 to 5 carbon atoms and thioalkyl groups, and hydrogen;
where X is chlorine, iodine, or bromine;
where Y is hydrogen, chlorine, iodine, bromine, lower alkyl, aralkyl, acyl of 2 to 4 carbon atoms or aryl of up to 12 carbons;
where Z is selected from lower alkyl, cycloalkyl of 3 to 8 carbon atoms, lower alkoxy or aryl of up to 12 carbon atoms, arylthio groups or aryloxy groups, each of up to 12 carbon atoms, lower alkyl-thio, di(lower alkyl)amino, pyrrolidino, piperidino and vinyl,
with the further proviso that the phosphine ligand cone angle of said palladium compound is between 170° and 180°.

4,612,391
PREPARATION OF OXYCARBOXYLIC ACIDS

William B. Edwards, III, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,417
Int. Cl.[4] C07C *59/76*
U.S. Cl. 562—577 20 Claims

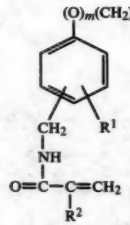
1. A process for the preparation of an oxocarboxylic acid product which comprises (1) forming a reaction medium by admixing an alicyclic α,β-olefinically unsaturated ketone compound having a ring size of between about 5–8 carbon atoms, with a liquid medium comprising an alcohol solvent and between about 5–50 weight percent of water, (2) passing a stream of ozone-containing gas through the reaction medium until substantially all of the ketone compound has interacted with the ozone, wherein the reaction medium is maintained at a temperature between about −70° C. and 50° C. during the reaction period; (3) diluting the reaction medium with water, and heating the diluted reaction medium and distilling off substantially all of the alcohol solvent; and (4) recovering from the concentrated aqueous medium an acyclic oxocarboxylic acid product which contains at least one carbon atom less per molecule than the α,β-olefinically unsaturated ketone starting material.

4,612,392
N-SUBSTITUTED ACRYLAMIDE AND METHACRYLAMIDE DERIVATIVES AND THEIR PREPARATION

Kaspar Bott, Wachenheim; Erich Penzel, Ludwigshafen, and Guenter Eckert, Limburgerhof, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,751
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207396
Int. Cl.[4] C07C *103/133*
U.S. Cl. 564—207 11 Claims

1. An N-substituted acrylamide or methacrylamide derivative of the formula I



(I)

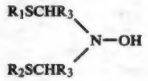
where m is 0 or 1, n is 1, 2, 3 or 4, n−m is 1, 2, 3 or 4, X is Br or Cl and R^1 and R^2 are each CH_3 or H.

4,612,393
BIS(SUBSTITUTED THIOALKYL)HYDROXYLAMINES AND STABILIZED POLYOLEFIN COMPOSITIONS

Ramanathan Ravichandran, Yonkers, and John D. Spivack, Spring Valley, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

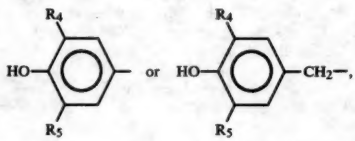
Filed Apr. 29, 1985, Ser. No. 728,364
Int. Cl.[4] C07C *83/00*; C09K *15/26*
U.S. Cl. 564—300 28 Claims

1. A compound of formula I



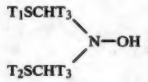
(I)

wherein R_1 and R_2 are independently



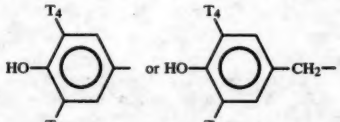
R_4 and R_5 are independently alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, alkaryl of 7 to 18 carbon atoms or aralkyl of 7 to 9 carbon atoms, and R_3 is hydrogen or alkyl of 1 to 12 carbon atoms.

8. A composition, stabilized against degradation, which comprises
(a) a material subject to oxidative, thermal or light-induced degradation, and
(b) a stabilizing amount of a compound of formula A



(A)

wherein
T_1 and T_2 are indpendently alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, alkaryl of 7 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or



where T_4 and T_5 are independently alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, alkaryl of 7 to 18 carbon atoms or aralkyl of 7 to 9 carbon atoms; or
T_1 and T_2 together are alkylene of 2 to 3 carbon atoms; and
T_3 is hydrogen or alkyl of 1 to 12 carbon atoms.

4,612,394
PROCESS FOR PRODUCING AMINOPHENYL-β-HYDROXYETHYLSULFONE

Norio Kotera, Amagasaki; Kazuhiro Tada, Kyoto; Shinzaburo Masaki, Ashiya; Kunihisa Goto, Kurashiki, and Tatsuo Kaneoya, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

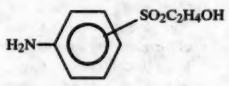
Filed Mar. 21, 1983, Ser. No. 477,443

Claims priority, application Japan, Apr. 6, 1982, 57-57483; Apr. 6, 1982, 57-57484; Apr. 6, 1982, 57-57485; Apr. 6, 1982, 57-57486

Int. Cl.⁴ C07C *85/11*

U.S. Cl. 564—420 11 Claims

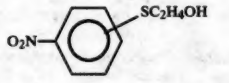
1. A process for producing aminophenyl-β-hydroxyethylsulfone of the formula (I),



(I)

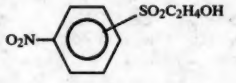
which comprises:

(1) condensing a nitrohalobenzene with mercaptoethanol in the presence of an alkali hydroxide and at least one reaction medium selected from N-alkyl-substituted amides and sulfoxides to produce mononitrophenyl-β-hydroxyethylsulfide of the formula (II),



(II)

(2) oxidizing the mononitrophenyl-β-hydroxyethylsulfide (II) to produce mononitrophenyl-β-hydroxyethylsulfone of the formula (III),



(III)

and

(3) reducing the mononitrophenyl-β-hydroxyethylsulfone to produce the aminophenyl-β-hydroxyethylsulfone of the formula (I).

4,612,395
PROCESS FOR THE PRODUCTION OF N-(2-METHYL-4-CHLOROPHENYL)-FORMAMIDINE DERIVATIVES

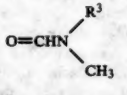
Roland Dousse, and Raoul Nebel, both of Monthey, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 826,807, Aug. 22, 1977, abandoned, which is a continuation of Ser. No. 662,305, Mar. 1, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,830

Int. Cl.⁴ C07C *123/00*

U.S. Cl. 564—245 4 Claims

1. The process for the preparation of an N-(2-methyl-4-chlorophenyl)-N'-methyl-N'-alkylformamidine which comprises reacting, in chloroform an N-methyl-N-alkylformamide of the formula



wherein R^3 is alkyl of up to 4 carbon atoms, with phosgene to form the adduct thereof and carbon dioxide, reacting said adduct, without isolation from said chloroform, with orthotoluidine to form N-(2-methylphenyl)-N'-methyl-N'-alkylformamidine hydrochloride, and chlorinating said N-(2-methylphenyl)-N'-methyl-N'-alkylformamidine hydrochloride with chlorine gas without isolation from said chloroform, at a temperature of from about 0° to 80° C.

4,612,396
PROCESS FOR THE PREPARATION OF PURE 2-ETHYLAMINO-4-NITRO-1-ALKOXYBENZENES

Wolfgang Koller, and Theodor Papenfuhs, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

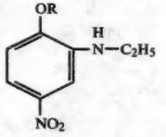
Filed Jun. 18, 1985, Ser. No. 745,921

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422807

Int. Cl.⁴ C07C *87/60*

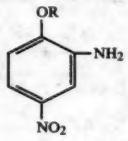
U.S. Cl. 564—441 2 Claims

1. A process for the preparation of pure 2-ethylamino-4-nitro-1-alkoxybenzenes of the formula (1)



(1)

in which R denotes an alkyl(C_1–C_4) or alkoxy(C_1–C_4)alkyl(C_1–C_4) group, which comprises N-monoalkylation of 2-amino-4-nitro-1-alkoxybenzenes of the formula (2)



(2)

in which R has the abovementioned meaning, using a slight excess of diethyl sulfate in non-polar, organic solvents in the absence of water at temperatures of about 40° to about 120° C.

4,612,397
USE OF SUPPORTED PHOSPHATE CATALYSTS FOR PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES

Terry L. Renken, Austin, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Division of Ser. No. 455,153, Jan. 3, 1983. This application Apr. 25, 1985, Ser. No. 727,307

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.⁴ C07C *85/06*

U.S. Cl. 564—479 4 Claims

1. In a method wherein monoethanolamine is reacted with ethylenediamine in the presence of a phosphorus containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

a. using, as a catalyst, a pelleted composition consisting essentially of titania having thermally chemically bonded thereto from about 0.5 to about 10 wt. % of phosphorous derived from a diamminohydrogen phosphate,

b. continuously contacting a mixture of ethylenediamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to

about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,612,398

ALKYL MERCAPTAN PROCESS

John Y. Lee, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 27, 1984, Ser. No. 604,892
Int. Cl.[4] C07C *148/00*
U.S. Cl. 568—73 9 Claims

1. A process for making alkyl mercaptan by the reaction of an aliphatic mono-olefinic hydrocarbon containing 10–20 carbon atoms with hydrogen sulfide in a molar ratio of about 5–50 moles of hydrogen sulfide per mole of olefin in a liquid phase while minimizing the formation of dialkyl sulfides, said process comprising

(a) forming a solution of hydrogen sulfide and a catalytic amount of a Lewis Acid in an inert solvent selected from carbon disulfide and aliphatic and aromatic halohydrocabons,

(b) adding said olefin to the hydrogen sulfide solution at a rate such that the mole ratio of unreacted olefin to hydrogen sulfide does not exceed about 0.05:1.0 and at a temperature of about −30° to 80° C. and

(c) recovering said alkyl mercaptan product.

4,612,399

PURIFICATION OF 4-FLUORO-4'-HYDROXYBENZOPHENONE

Howard M. Colquhoun, and David F. Lewis, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 13, 1985, Ser. No. 733,362
Claims priority, application United Kingdom, May 24, 1984, 8413314
Int. Cl.[4] C07C *45/81*
U.S. Cl. 568—324 10 Claims

1. A process for increasing the purity of 4-fluoro-4'-hydroxybenzophenone which comprises dissolving a mixture of isomers of fluoro-4'-hydroxybenzophenone, including 4-fluoro-4'-hydroxybenzophenone, in an aqueous solution of a base to obtain a solution of the isomers, adding an acid to the obtained solution to reduce the pH of the solution and to give a precipitate, adding sufficient of the acid to reduce the pH of the solution to not less than 9, and separating the precipitate formed from the solution.

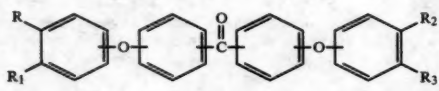
4,612,400

AUTOXIDATION OF BIS(ORTHO DIALKYL-PHENOXY)BENZOPHENONES

Visweswara R. Durvasula, Cheshire, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 701,835, Feb. 14, 1985, Pat. No. 4,577,037. This application Dec. 20, 1985, Ser. No. 811,797
Int. Cl.[4] C07C *49/784*
U.S. Cl. 568—333 4 Claims

1. A bis(ortho dialkyl-phenoxy)benzophenone having the formula



wherein R, R_1, R_2, and R_3 are independently seleted from linear lower alkyl.

4,612,401

PROCESS FOR THE PREPARATION OF 4-HYDROXY-2,4,6-TRIMETHYL-2,5-CYCLOHEXADIENONE

Michel Costantini, Lyons; Francoise Igersheim, Villeurbanne, and Leon Krumenacker, Serezin du Rhone, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Mar. 19, 1985, Ser. No. 713,692
Claims priority, application France, Mar. 22, 1984, 84 04442
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.
Int. Cl.[4] C07C *45/42*
U.S. Cl. 568—362 5 Claims

1. Process for the preparation of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadienone which comprises reacting 2,4,6-trimethylphenol with chlorine in an inert organic solvent selected from the class consisting of an aliphatic or cycloaliphatic hydrocarbon, a polychlorinated aliphatic hydrocarbon, an aromatic hydrocarbon, a chlorinated aromatic hydrocarbon, an ether, an ester or a nitrile, in the absence of base, removing the hydrogen chloride as it is formed by the passage of a stream of inert gas through the reaction mixture or by distillation of the organic solvent under ambient or reduced pressure, and hydrolysing the reaction mixture with water in the presence or absence of an inorganic base.

4,612,402

OXIDATION OF OLEFINS USING RHODIUM NITRO COMPLEX

Deborah A. Muccigrosso, Somerville; Frank Mares, Whippany; Steven E. Diamond, New Providence, and Jeffrey P. Solar, Flanders, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 29, 1982, Ser. No. 362,725
Int. Cl.[4] C07C *45/28*
U.S. Cl. 568—408 11 Claims

1. A a process for the oxidation of olefinically unsaturated substrates of the formula R—CH=CH—R' wherein R and R' are independently selected from members of the group consisting of H, alkyl, alkenyl, cycloalkyl, aryl, and halo-, cyano- and ether substituted alkyl, alkenyl, cycloalkyl and aryl, which comprises reacting, in the liquid phase and in the substantial absence of an additional Group VIII metal, said substrate with a rhodium nitro complex of the formula L_nRhNO_2 wherein n is 4 or 5 and wherein L_n represents any combination of monodentate, bidentate, tridentate and tetradentate ligands such as to provide four or five bonding sites, for a time sufficient to produce an oxidized product of the formula $RCH_2C(O)R'$ and a reduced product of the formula L_nRhNO.

4,612,403

HYDROFORMYLATION OF OLEFINIC COMPOUNDS IN THE PRESENCE OF A COBALT CATALYST AND AN ORGANIC NITRILE PROMOTER

Michael J. Virnig, Fridley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Jun. 20, 1985, Ser. No. 747,149
Int. Cl.[4] C07C *45/50, 27/22*
U.S. Cl. 568—454 15 Claims

1. A process for preparing a formylated olefinic fatty compound comprising reacting an olefinic fatty compound having at least 9 carbon atoms with carbon monoxide and hydrogen in the presense of a catalytic amount of a soluble cobalt salt catalyst and a promoter comprised of an organic nitrile selected from the group consisting of cyano-substituted alkanes having from 2 to 44 carbon atoms and cyano-substituted alkenes having from 4 to 22 carbon atoms containing no substituent other than cyano.

4,612,404

PROCESS FOR TREATMENT OF FLUIDS CONTAMINATED WITH POLYCHLORINATED BIPHENYLS

Budalur S. Thyagarajan, 4518 Maybrook Woods, San Antonio, Tex. 78249

Continuation of Ser. No. 381,312, May 24, 1982. This application Nov. 16, 1983, Ser. No. 552,291

Int. Cl.[3] C07C *37/02, 39/12*

U.S. Cl. 568—730 13 Claims

1. A method of treating a quantity of a liquid containing polychlorinated biphenyls as a contaminant in said liquid comprising the step of:

mixing said quantity of liquid with an alkali earth metal hydroxide selected from Group IIA of the Periodic Table.

4,612,405

CONTINUOUS SORPTION PROCESS

David J. A. McCaffrey, Cheltenham; Percy E. Rogers, Derby, and James Carlton, Cheltenham, all of England, assignors to Coal Industry (Patents) Ltd., London, England

Filed May 23, 1985, Ser. No. 737,206

Int. Cl.[4] C07C *29/76, 31/08*

U.S. Cl. 568—916 6 Claims

1. A quasi-continuous or continuous sorption process requiring a hot gas regeneration step, comprising passing a liquid phase containing a component to be sorbed through at least three fixed bed sorption zones connected in series, detecting the approach of saturation of all of said zones, stopping the flow of liquid through the zones upon detection of the approach of saturation of the final zone, and initiating regeneration using hot gas through said zones upon said detection, all said zones being regenerated in parallel.

4,612,406

OLEFIN OLIGOMERIZATION

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-on-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 551,881, Nov. 15, 1983, Pat. No. 4,528,414. This application May 9, 1985, Ser. No. 732,134

Int. Cl.[4] C07C *2/04*

U.S. Cl. 585—329 31 Claims

1. The process for the oligomerization of linear and/or branched chain C_2 to C_{12} olefins which comprises contacting said olefins at effective process conditions for said oligomerization with an oligomerization catalyst comprising at least one molecular sieve selected from the group consisting of FAPO, TAPO and MeAPO characterized by an adsorption of triethylamine less than 5 percent by weight at a pressure of 2.6 torr and a temperature of 22° C.

4,612,407

ALIPHATIC AROMATIZATION WITH INTEMETALLIC GROUP VIII–IIIA, IVA CATALYST

Lawrence H. Dubois, Berkeley Heights, and Ralph G. Nuzzo, Summit, both of N.J., assignors to AT&T Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 611,129, May 17, 1984, abandoned, Division of Ser. No. 481,160, Apr. 1, 1983, Pat. No. 4,507,401. This application Jan. 29, 1986, Ser. No. 823,149

Int. Cl.[4] C07C *5/367, 5/393*

U.S. Cl. 585—434 11 Claims

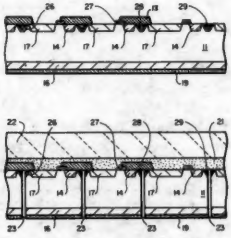
1. A catalytic process comprising the steps of contacting an aliphatic organic compound with an intermetallic catalyst to produce an aromatic compound characterized in that said intermetallic catalyst comprises at least two metals bound by intermetallic chemical bonds wherein said intermetallic catalyst is produced by the process comprising the steps of forming a Group VIII containing metal material on a supporting substrate and reacting said metal material with a reactant comprising a metal containing substance chosen from the group consisting of metal hydrides and organometallic materials where said reactant contains at least one member chosen from the group consisting of silicon, germanium, aluminum, boron, gallium, indium, and tin.

4,612,408

ELECTRICALLY ISOLATED SEMICONDUCTOR INTEGRATED PHOTODIODE CIRCUITS AND METHOD

Garret R. Moddel; Lee A. Christel, and James F. Gibbons, all of Palo Alto, Calif., assignors to Sera Solar Corporation, Santa Clara, Calif.

Filed Oct. 22, 1984, Ser. No. 663,757
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 136—244 14 Claims



1. The method of forming an interconnected array of solar cell or photodiode devices which includes the steps of forming on one major surface of a semiconductor wafer a plurality of said devices, forming grooves in said one major surface extending partway into said substrate between adjacent said devices, forming an oxide layer on selected portions of said one major surface and on the surfaces of said grooves, filling the grooves with an insulating material, forming metal interconnects between adjacent devices extending over said grooves and insulating material, attaching said one major surface to an insulating support, and severing through the wafer into the grooves from the other major surface to separate adjacent devices while leaving the metal interconnects.

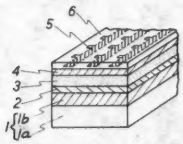
14. A solar cell formed by the method of claim 1.

4,612,409

FLEXIBLE PHOTOVOLTAIC DEVICE

Yoshihiro Hamakawa, Kawanishi; Yoshihisa Tawada; Kazunori Tsuge, both of Kobe, and Masanobu Izumina, Omiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1982, Ser. No. 439,627
Claims priority, application Japan, Nov. 4, 1981, 56-177685; Dec. 15, 1981, 56-203155; Dec. 28, 1981, 56-213119; Apr. 9, 1982, 57-60109
Int. Cl.[4] H01L *27/14, 31/06*
U.S. Cl. 136—244 3 Claims



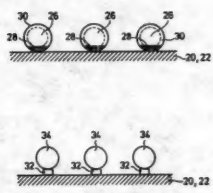
1. A photovoltaic device comprising a substrate including a metal foil and an overlying electric insulating thin film having an electric conductivity of not more than about 10^{-7} $(\Omega\text{-cm.})^{-1}$ during light impingement and a photovoltaic device body of non-single-crystal semiconductors, the device body being formed over said electric insulating thin film, wherein said electric insulating thin film includes a polymer layer contiguous to said metal foil and an inorganic material layer contiguous to an electrode for said photovoltaic device body.

4,612,410

CONTACT SYSTEM FOR THIN FILM SOLAR CELLS

Gert Hewig, Alzenau; Hans Huschka, Hanau; Bernd Schurich, Bruchkoebel, and Jörg Wörner, Grosskrotzenburg, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,345
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339417
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—256 3 Claims



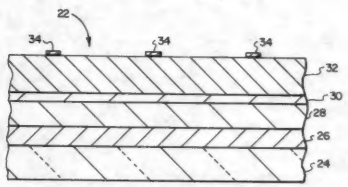
1. A thin film solar cell with an upper semiconductor layer adapted to face a source of light and a front contact deposited on said semiconductor layer, wherein a passivation layer is deposited onto said front contact before said front contact is deposited onto said semiconductor layer, the chemical potential of said passivation layer being matched to the chemical potential of the semiconductor layer.

4,612,411

THIN FILM SOLAR CELL WITH ZNO WINDOW LAYER

Robert D. Wieting, Simi Valley, and Richard R. Potter, Chatsworth, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 4, 1985, Ser. No. 740,946
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—265 11 Claims



1. A thin film photovoltaic device comprising, in order, a first layer of copper indium diselenide semiconductor, a second layer of high resistivity zinc oxide semiconductor in contact with said first layer, and a third layer of low resistivity zinc oxide semiconductor in contact with said second layer.

4,612,412

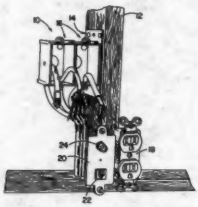
ELECTRICAL OUTLET BOX ASSEMBLY

James J. Johnston, Old Saybrook, Conn., assignor to Brand-Rex Company, Willimantic, Conn.

Filed Aug. 2, 1984, Ser. No. 637,145
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—65 R 6 Claims

3. An electrical outlet box comprising a plurality of walls including a top wall, a bottom wall, a pair of opposing side walls connected to and extending between said top wall and said bottom wall, and a rear end wall cooperating with said top wall, said bottom wall and said side walls to define a generally rectangular box for receiving an electrical fixture therein and having a frontal opening, a cable receiving opening defined at

least in part by one of said walls, and a cable clamping member supported on said outlet box and associated with said cable receiving opening, said clamping member having a body portion and including an air cap attached to said body portion at a region of weakening, said cable clamping member being movable relative to said outlet box from a cable receiving position to a clamping position wherein said clamping member



clampingly engages a cable extending through said cable receiving opening to resist separation of the cable from said outlet box in response to force applied to the cable in a direction away from said outlet box, said air cap forming a closure for said cable receiving opening when said clamping member is in its cable receiving position, said air cap being adapted to break away from said body portion in response to inwardly directed force applied to said air cap.

4,612,413

AUTHENTICATION SYSTEM BETWEEN A CARD READER AND A PAY CARD EXCHANGING DATA

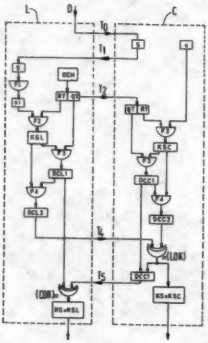
Serge Robert, Jouy en Josas; Olivier F. Cahart, Versailles, and Pierre Le Marchant, Clamart, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1984, Ser. No. 632,092

Claims priority, application France, Jul. 29, 1983, 8312528

Int. Cl.[4] H04L *9/00*

U.S. Cl. 178—22.08 **7 Claims**



1. A reciprocal authentication system for mutually authenticating an interconnected reader terminal as a first station and an electronic card as a second station towards each other, said card storing a personalized first secret code (S) and personalized second secret code (S), said second secret code being linked to said first secret code by means of a first non-personalized secret transformation function (F1), said system comprising:

first transfer means (T1) for transferring said first secret code to said terminal,

in said terminal first processing means for recovering by means of said first transformation function (F1) said second secret code (s1);

in one of said stations random number generating means (GEN) for generating a random number (RT, QT) as a session key and second transfer means (T2) for transferring this random number to the other station;

in either station second processing means for receiving said second secret code and a first part (RT) of said random number for generating by means of a second transformation function (F2) a reader access key and a card access key, respectively (KSL, KSC),

in either station third processing means for receiving said reader access key and card access key, respectively, and furthermore a second part (QT) of said random number for generating a means of a third transformation function (F3) first reader comparison data and first card comparison data, respectively (DCL1, DCC1),

in either station fourth processing means for receiving said reader access key and card access key, respectively, and furthermore said reader comaprison data and card comparison data, respectively for generating by means of a fourth transformation function (f4) second reader comparison data and second card comparison data (DLC2, DCC2), respectively,

third transfer means (T4) for transferring said second reader comparison data and said second card comparison data from a sending station to a receiving station,

in said receiving station first comparing means for comparing said second reader comparison data and second card comparison data and upon equality generating a first authorization signal, (LOK),

fourth transfer means (T5) for transferring under control of said first authorization signal comparison data from said receiving station to said sending station,

in said sending station second comparing means for comparing said first reader comparison data and first card comparison data and upon equality generating a second authorization signal (COK), the combination of said first and second authorization signals enabling further transfer of information between said two stations.

4,612,414

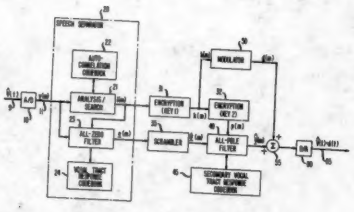
SECURE VOICE TRANSMISSION

Biing-Hwang Juang, Lincroft, N.J., assignor to AT&T Information Systems Inc., Middletown, N.J.

Filed Aug. 31, 1983, Ser. No. 527,962

Int. Cl.[4] H04M *1/70*

U.S. Cl. 179—1.5 R **30 Claims**



4. Apparatus comprising

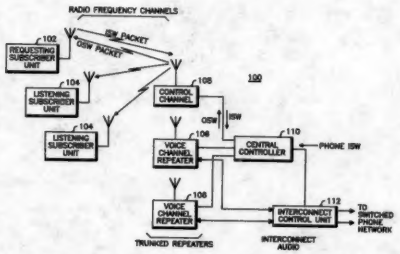
first means for applying to a transmission channel a first signal which includes information indicative of the vocal tract response of a voice signal, and

second means for applying to said transmission channel a second signal which includes scrambled information indicative of the excitation component of said voice signal, said excitation information being represented in said second signal in continuous form.

4,612,415
DYNAMIC CONTROL OF TELEPHONE TRAFFIC IN A TRUNKED RADIO SYSTEM

Kenneth J. Zdunek, Schaumburg, and Garry C. Hess, Hanover Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 3, 1984, Ser. No. 637,515
Int. Cl.[4] H04B *1/00*
U.S. Cl. 179—2 EB **21 Claims**



1. A method for optimizing dispatch access delay in a trunked radio system which is coupled to a conventional telephone interconnect system, said method comprising the steps of:

(a) measuring average system dispatch access delay;

(b) measuring the current number of simultaneous interconnect calls;

(c) measuring the duration of each of said interconnect calls;

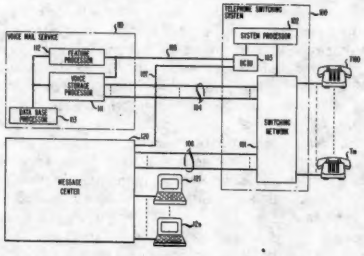
(d) queuing subsequent interconnect call requests if the measured number of simultaneous interconnect calls is greater than or equal to a set predetermined value; and

(e) terminating any particular measured interconnect call if the duration of said call exceeds a set predetermined maximum period.

4,612,416
INTEGRATED MESSAGE SERVICE SYSTEM

William D. Emerson, Boulder; Deborah J. Hill, Denver; Karen C. Loeb, Englewood; Albert Mizrahi; Charles T. Schlegel, both of Boulder, all of Colo., and Lowell C. Scott, Old Bridge, N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jan. 22, 1985, Ser. No. 693,474
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.11 **19 Claims**



1. In a business communication system comprising a telephone communication system having a system processor and a plurality of message service systems, wherein said message service systems are each connected to said telephone communication system by communication lines to enable a user on said telephone communication system to access any one of said message service systems designated by said user, a message access system comprising:

exchanging means connected to and interconnecting said plurality of message service systems and said telephone communication system and responsive to a user accessing one of said message service systems for exchanging call related data between said one message service system and said telephone communication system;

means connected to said exchanging means and said system processor and responsive to the appearance of said call related data on said exchanging means for storing an indication of the current message status of said user on said system processor of said telephone communication system; wherein said system processor is responsive to a user on said telephone communication system accessing one of said plurality of message service systems via said communication lines for transmitting said message status associated with said accessing user to said accessed message service system via said exchanging means;

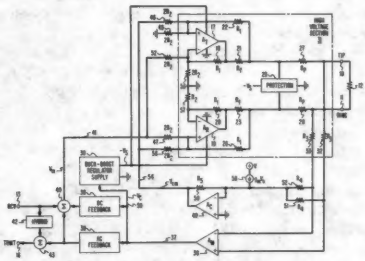
means in each of said message service systems responsive to said transmitted message status for providing an indication of said transmitted message status to said accessing user; and

means in each of said message service systems responsive to said accessing user generating a message retrieval request for forwarding, via said exchanging means and said one message service system, unretrieved messages for said accessing user stored on other than said one message service system.

4,612,417
ELECTRONIC BATTERY FEED CIRCUIT FOR TELEPHONE SYSTEMS

Rouben Toumani, Randolph Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 27, 1984, Ser. No. 635,209
Int. Cl.[4] H04M *19/08*
U.S. Cl. 179—77 **16 Claims**



1. An electronic battery feed circuit comprising

tip and ring amplifiers for sourcing and sinking current for respective conductors of a telephone subscriber line, each amplifier having complementary inverting and noninverting types of input connections, and

a feedback circuit for both common mode and metallic signals extending from signal output connections of said amplifiers to signal input connections thereof, said feedback circuit comprising

means in an input of said feedback circuit for reducing both common mode and metallic signal voltages coupled thereto from said output connections,

a common mode amplifier having an input coupled to receive common mode signals at a low-voltage end of said reducing means and an output coupled to an input of each of said tip amplifier and said ring amplifier, such inputs being of the same one of said types, and

means, in an output of said feedback circuit, for coupling

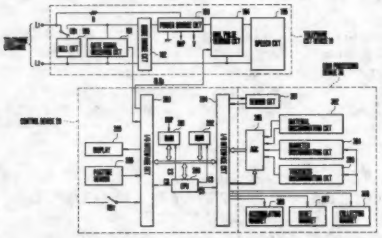
metallic feedback signals to an input of each of said amplifiers, such inputs being of complementary types.

4,612,418

METHOD FOR CONTROLLING TASK PROCESS AND DEVICE THEREOF

Yoshiaki Takeda, Kanagawa; Takashi Oyamada; Toshiaki Hayasaka, both of Tokyo; Osamu Kai, Kanagawa, and Toshimichi Kubota, Saitama, all of Japan, assignors to Tamura Electric Works, Ltd., Japan

Filed Jun. 5, 1984, Ser. No. 617,462
Claims priority, application Japan, Jun. 14, 1983, 58-106221
Int. Cl.[4] H04M *17/02*
U.S. Cl. 179—81 R 19 Claims



3. A task processing control device for use in a public telephone set of the type having a speech circuit and a dial signal generation circuit disposed on the loop line of the telphone office, a receiver and a transmitter coupled with said speech circuit, and a coin processing unit, said task processing control device comprising:

signal generation means for cyclically generating base signals, each base signal having a period longer than the period of time required for the processing of any single one task of a set of tasks comprising coin processing, dial control processing, hook processing and charge processing;

detection means for detecting processing demands each time a base signal is generated by said signal generation means, each processing demand identifying one task of said set of tasks which needs to be executed;

memory means for storing in predetermined storage locations a plurality of task processing programs, each of said task processing programs being associated with a respective one task of said set of tasks;

selection means for selecting a single processing demand to be executed from among all of the task processing demands detected by said detection means and which has not been previously processed;

address designation means for designating the task processing program stored in said memory means which is associated with said single processing demand selected by said selection means;

task execution means for executing the task processing program designated by said address designation means; and

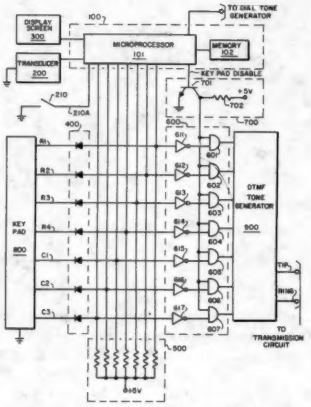
idling mode control means for disabling said detection means, selection means, address designation means and task execution means in response to the completion of the execution of a task processing program by said task execution means and in response to the failure of said selection means to select a single processing demand.

4,612,419

TOLL RESTRICTION CIRCUIT FOR AN ELECTRONIC TELEPHONE STATION

Louis W. Smith, St. Petersburg, Fla., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Jan. 2, 1985, Ser. No. 688,230
Int. Cl.[4] H01M *1/66*
U.S. Cl. 179—90 D 21 Claims



1. A toll restriction circuit for use in a telelphone station that includes a keypad having a plurality of pushbuttons, each operable to provide a different pair of row and colum signals identifying an associated pushbutton digit, a tone generator, operable in response to each pair of row and column signals to provide an associated pair of tone signals, and a pair of hookswitch contacts, operable to provide on-hook and off-hook signals, said toll restriction circuit comprising:

a miscroprocessor connected to said keypad and said hookswitch;

a memory connectd to said microprocessor and operated to store a predetermined toll call identifying digit and a toll restriction bit;

said hookswitch being operated to provide an off-hook signal when a telephone call is initiated and an on-hook signal when a telphone call is terminated;

said microprocessor being operated in response to said off-hook signal and the first subsequent pushbutton digit, to retrieve said toll call indentifying digit from said memory, to compare said pushbutton digit to said toll call indentifying digit, and to provide an enable signal in response to miscomparison thereof and further operated in response to comparison thereof to retrieve said toll restriction bit from said memory; and operated in response to said toll restriction bit having first and second characteristics to provide a disable signal and said enable signal, respectively; and

gating means connected to said microprocessor and further connected vetween said keypad and said tone generator, and operated in response to said enable signal to electrically connect said tone generator to said keypad, whereby said tone generator is operated in response to each pair of row and column signals to provide said associated pair of tone signals;

said gating means further operated in response to said disable signal to electrically disconnect said tone generator from said keypad, whereby said row and column signals are restricted from causing said tone generator to provide associated toll call tone signals;

said microprocessor being further operated in response to said on-hook signal to cause said toll restriction bit to have a value of said first characteristic;

said microprocessor being further operated in response to

operation of said keypad in a manner different from momentary depression of a single pushbutton to provide a sensible control signal;

sensible indicating means connected to said microprocessor and operated in response to said sensible control signal to provide a sensible signal;

said keypad being operated in reponse to said sensible signal to provide a plurality of pairs of row and column signals representative of a keypad signaled password;

said microprocessor being further operated in response to said keypad signaled password to retrieve said stored password from said memory and to compare said keypad signaled password to said stored password;

said microprocessor being further operated in response to a comparison thereof to cause said toll restriction bit to have a value of said second characteristic.

4,612,420

LOUDSPEAKER SYSTEM FOR CONVERTING A DIGITIZED ELECTRIC SIGNAL INTO AN ACOUSTIC SIGNAL

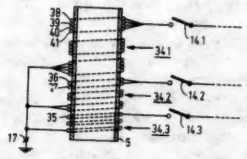
Joris A. M. Nieuwendijk, and Wilhelmus D. A. M. Van Gijsel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,379

Claims priority, application Netherlands, Sep. 15, 1983, 8303184

Int. Cl.⁴ H04R *9/00, 3/08, 7/06, 9/06*

U.S. Cl. 179—115.5 PV **9 Claims**



1. A loudspeaker system for converting an n-bit digitized electric signal (n being an integer and ≥ 2) into an acoustic signal comprising: an electrodynamic transducer comprising a diaphragm, a magnet system and n voice-coil devices which cooperate with the magnet system, means for driving each of the n voice-coil devices in accordance with the value of a respective one of the n bits of the digitized electric signal, said voice-coil devices having conductors of the same length and being made of a material of the same specific mass and specific resistance for all the voice-coil devices, an index m (m being an integer and $\leq n$) being assigned to each said voice-coil device with an index 1 assigned to a first voice-coil device which corresponds to the most significant bit of the n bits of the digitized electric signal, and with consecutive indices to voice-coil devices corresponding to consecutive less significant bits of the n bits of the digitized electric signal and with the highest index assigned to the voice-coil device corresponding to the least significant bit of the n bits of the digitized electric signal, whereby the ratio between an area A_m of the perpendicular cross-section of the conductor of the m^{th} voice-coil device and an area A_1 of the perpendicular cross-section of the conductor of the first voice-coil device satisfies the equation:

$$A_m : A_1 = 1 : 2^{m-1}$$

characterized in that the conductor of the m^{th} voice-coil device comprises $p \times 2^{n-m}$ wires of equal cross-section connected in parallel with each other, p being greater than or equal to one and being the number of wires of the conductor of the n^{th} voice-coil device corresponding to the least significant bit and m ranging from 1 to n inclusive.

4,612,421

METHOD OF AND TEST ARRANGEMENT FOR TESTING THE TRANSMISSION PATH WITHIN AN APPARATUS OF A MODULAR CONSTRUCTION FOR INTERRUPTIONS

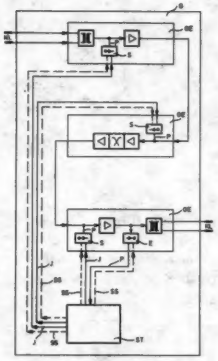
Günther Späth, Happurg, and Werner Zeder, Kronach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,269

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339155; Oct. 28, 1983, 3339156

Int. Cl.⁴ H04M *3/28*

U.S. Cl. 179—175 **8 Claims**



1. A method of testing the transmission path within an apparatus of a modular construction, for interruptions, using a test arrangement comprising at least one transmitter, at least one receiver and a control device, characterized in that in a test cycle, the control device sequentially drives transmitters which are included in each module, and the transmitted test signals are received by the receiver arranged at the end of the transmission path in a module and being controllable by the control device, and that the control device ends the test cycle when a transmitted test signal is received by the receiver.

4,612,422

SINGLE IN-LINE PACKAGE SWITCH

William H. Rose, and David T. Shaffer, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 485,549, Apr. 15, 1983, Pat. No. 4,496,802. This application Nov. 15, 1984, Ser. No. 671,537

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.⁴ H01H *5/18*

U.S. Cl. 200—5 R **3 Claims**

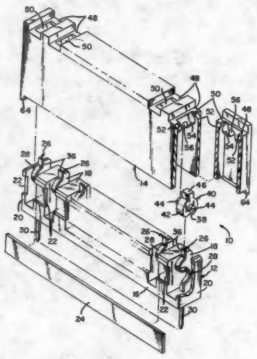
1. An electrical switch of the type comprising a dielectric housing in which movable electrical contact means are mounted in actuating alignment with stationary electrical contact means, actuating means in engagement with respective free ends of the movable electrical contact means, and means provided by the dielectric housing mounting the movable electrical contact means, the stationary electrical contact means and the actuating means therein, characterized in that:

each of said movable electrical contact means has a curved contact section, the free end of said curved contact section is disposed in a recess of a respective one of said actuating means;

said stationary electrical contact means extending along an inside side surface of said housing;

said actuating means when moved to one position moves the curved contact section of the respective movable electrical contact means into electrical engagement with said

stationary electrical contact means, said actuating means when moved to another position moves the curved contact section of the respective movable electrical contact means free of the stationary electrical contact



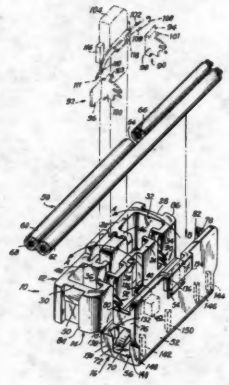
means, and the spring forces of the curved contact section maintain the respective movable electrical contact means and actuating means in the one or the other position without said movable contact means being stressed into a different shape.

4,612,423

LINE SWITCH

Ronald G. Munroe, Staten Island, N.Y., assignor to Eagle Electric Mfg. Co. Inc., Long Island City, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,029
Int. Cl.[4] H01H *15/10*
U.S. Cl. 200—16 R **20 Claims**



1. A line switch, comprising:

(A) an electrically-insulating switch housing of one-piece construction, said housing having a body portion and an integral cover portion hinged to the body portion for pivoting movement about a longitudinal axis,

(i) said body, portion having a base wall in which a first slot is formed, and side walls extending from the base wall and bounding an interior space within the body portion,

(ii) one of the side walls extending along a longitudinal direction and having formed therein a pair of recesses longitudinally spaced apart from each other by a predetermined distance, and

(iii) another of the side walls extending generally parallel to said one side wall and having a resilient tab integral with the other side wall,

(iv) said cover portion having a top wall in which a second slot is formed, and channel walls bounding a longitudinally-extending channel in which an open elongated electrical wire having longitudinally spaced-apart electrical conductors is received;

(v) said cover portion being pivotable from an access position in which the open wire is freely laid along the channel, to an assembled position in which the top wall of the cover portion overlies the base wall of the body portion and in which the first and second slots are in mutually juxtaposed alignment along a transverse direction,

(vi) said body portion and said cover portion having cooperating locking surfaces for maintaining the assembled position with a snap action;

(B) a pair of electrically-conducting terminals, each fixedly mounted in a respective one of the recesses, each terminal having a stationary contact portion mounted within the interior space of the body portion, and a piercing projection extending transversely from the stationary contact portion and outwardly of the body portion, each piercing projection having a sharp free end operative for piercing through and electromechanically engaging a respective conductor in said assembled position of the cover portion;

(C) a pair of electrically-conducting and interconnected movable contact portions mounted within the interior space of the body portion and longitudinally spaced apart from each other by said predetermined distance; and

(D) an electrically-insulating armature on which the movable contact portions are mounted for joint movement along the transverse direction between a closed and an open position in which the movable contact portions electromechanically engage and are disengaged from, respectively, the stationary contact portions to thereby electrically connect and disconnect, respectively, the electrical conductors,

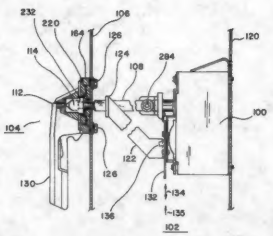
(i) said armature having a pair of transversely spaced-apart indents, each engageable by the resilient tab to affirmatively maintain the armature in a selected one of the closed and the open positions.

4,612,424

DOOR MOUNTED CIRCUIT BREAKER OPERATING APPARATUS

Michael R. Clark; Dominick Tringali, both of Columbia; Fredrick E. Woodlief, Lexington, and Miklos J. Orosz, Columbia, all of S.C., assignors to Square D Company, Palatine, Ill.

Filed Oct. 31, 1984, Ser. No. 666,945
Int. Cl.[4] H01H *9/20*
U.S. Cl. 200—50 A **12 Claims**



8. A circuit breaker operating apparatus having an enclosure, a circuit breaker mounted inside said enclosure, and a

hand lever rotatably mounted upon a door of said enclosure comprising:

a drive shaft rotatably attached at a first end to said circuit breaker so that rotation of said drive shaft operates said circuit breaker, and when said door is closed a second end of said drive shaft seats in a socket in said hand lever, and rotation of said hand lever rotates said drive shaft, said drive shaft having a reduced cross-section region between said first end and said second end;

an interlock mounted in a fixed position with respect to said door of said enclosure, and said interlock having a shaped opening for receiving said drive shaft as said door is closed, and said second end of said drive shaft having a shaped cross-section having a size to fit through said shaped opening when said shaped opening is aligned with said drive shaft, and when said door is closed said reduced cross-section region of said drive shaft is located within said shaped opening of said interlock permitting rotation of said drive shaft, and said interlock prevents opening of said door when said drive shaft is in a position corresponding to an "on" condition of said circuit breaker by catching said second end of said drive shaft, so that when said door is closed and said circuit breaker is in an "on" condition, then said interlock prevents opening of said door.

4,612,425

STEERING WHEEL HAVING BOSS PORTION WITH ENERGY ABSORBING LAYER AND MEMBRANE SWITCH

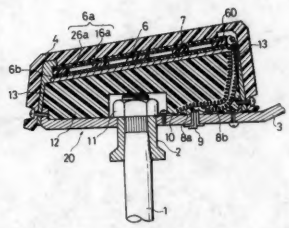
Makoto Kanai, Nagoya; Hiroshi Sugita, Ichinomiya, and Makoto Kawai, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 21, 1985, Ser. No. 704,029

Claims priority, application Japan, Feb. 22, 1984, 59-24352[U]

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—61.55 **4 Claims**



1. A steering wheel having a boss portion and including:

an energy absorbing layer formed on said boss portion, and

a membrane switch disposed on said energy absorbing layer and comprising:

superposed first, second and third plastic films, the second plastic film being interposed between the first and third plastic films,

metallic films formed on the opposed surfaces of said plastic films, and

spacers maintaining said metallic films at a predetermined spacing,

the elastic constant between the first and second plastic films and that between the second and third plastic films being different thereby achieving electric conduction between the opposed metallic films on the first and second plastic films and between the opposed metallic films on the second and third plastic films at different timings upon exertion thereon of pressure from the first plastic film.

4,612,426

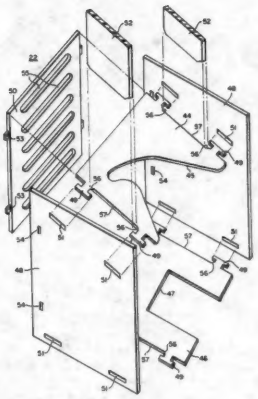
ARC CHUTE ASSEMBLY FOR CIRCUIT BREAKER

Alfred E. Maier, Chippewa Township, Beaver County; James R. Farley, and Nicholas A. Tomasic, both of Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 23, 1985, Ser. No. 768,774

Int. Cl.[4] H01H *33/08*

U.S. Cl. 200—144 R **12 Claims**



1. In combination with a circuit breaker having a pair of separable contacts and operating means adapted to open the contacts in response to line overload conditions, an arc chute assembly located adjacent the separable contacts and comprising;

a pair of side members and a back member disposed to define an arc-extinguishing chamber,

a plurality of arc chute plates supported in stacked spaced-apart relationship between said side members, each of said plates having a pair of tabs that extend from each side of the respective plates through and beyond slot openings in the side members, said tabs being notched to permit shifting of the plates into interlocking engagement with the side members after the tabs have been inserted into the respective slot openings and said tabs also being configured to provide gaps between the tabs and adjacent surfaces of the side members, and

means locking the arc chute plates to the respective side members comprising a pair of elongated key members disposed in said gaps in tightly-wedged relationship between the face of the respective side members and the notched portions of the associated tabs of the arc chute plates.

4,612,427

SWITCH

Teijiro Mori, Nishinomiya; Hiroyuki Okado, Owariasahi; Shizutaka Nishizako, Tajimi; Shigeharu Otsuka, Gifu, and Shigeru Masuda, Ichinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00396, § 371 Date Jul. 2, 1984, § 102(e) Date Jul. 2, 1984, PCT Pub. No. WO84/02032, PCT Pub. Date May 24, 1984

PCT Filed Nov. 4, 1983, Ser. No. 629,536

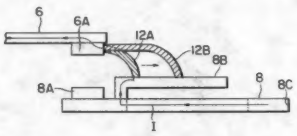
Claims priority, application Japan, Nov. 10, 1982, 57-197059; Dec. 3, 1982, 57-183202; Dec. 24, 1982, 57-229544

Int. Cl.[4] H01H *33/20*

U.S. Cl. 200—144 R **16 Claims**

1. A switch comprising: a housing; a stationary contact mounted in the housing; a stationary contact element joined to the stationary contact; a movable contact movably mounted in

the housing for movement toward and away from the stationary contact; a movable contact element joined to the movable contact for movement therewith and being disposed in opposed facing relation to the stationary contact element; the stationary contact having a hollow cut-out portion spaced from but in the vicinity where the stationary contact element is joined thereto; and an arc runner electrically connected to the stationary contact at a location between the stationary contact



element and stationary contact cut-out portion, the arc runner extending outwardly from the stationary contact and extending over at least part of the stationary contact cut-out portion, and the arc runner having a configuration effective to ensure that the distance between the arc runner and movable contact element does not increase during at least the initial course of movement of the movable contact element away from the stationary contact element.

4,612,428

COMPRESSED GAS CIRCUIT BREAKER ABLE TO BE ASSEMBLED AND DISASSEMBLED WITHOUT A SIGNIFICANT LOSS OF GAS

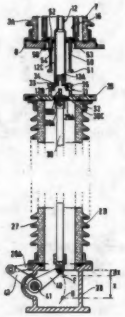
Dante Nicoloso, Jonage, France, assignor to Alsthom, France

Filed Jul. 23, 1985, Ser. No. 757,988

Claims priority, application France, Jul. 25, 1984, 84 11787

Int. Cl.[4] H01H *33/54*

U.S. Cl. 200—148 R **3 Claims**



1. A compressed gas circuit breaker able to be assembled and disassembled without significant loss of gas, comprising for each pole thereof a first enclosure and a second enclosure filled with gas under pressure, and first enclosure comprising a first envelope, a base and a top and containing fixed contacts and a moving assembly comprising contacts cooperating with said fixed contacts, said moving assembly being operable to be moved by means of a control rod, said base having an axial opening for passage of said control rod, said second enclosure comprising a second envelope resting on a housing and containing a connecting rod articulated on a crank swivelling about a shaft through said housing, said shaft being connected outside the housing to rotational driving means, said second enclosure having a tubular spacer thereon, said first and second enclosures being, when the circuit breaker is assembled, coaxially superposed and fastly connected together, said connecting rod and said control rod being connected fast end to end, said moving assembly thus having an operating stroke going from a first position where the breaker is open to a second position where the breaker is closed,

wherein said circuit breaker said moving assembly is movable beyond said second position by an overstroke produced by an increased rotation of said shaft, said shaft comprising a means for locking it in overstroke positon, said first enclosure comprising a sliding tubular air lock operable, when the moving assembly is in overstroke configuration, to assume a position ensuring gastight closure of said first enclosure, said air lock having an annular head in which engages a larger-diameter end piece of said control rod, said head sliding in a sealed manner in a closed cylindrical part within and coaxial to said first enclosure, the connecting rod of the second enclosure comprising a head which, when the moving assembly is in overstroke configuration, engages in a gastight manner with the spacer, said spacer having a transverse opening in line with which the ends of said control rod and connecting rod that are to be connected together meet when the bottom of the air lock comes to bear upon the spacer.

4,612,429

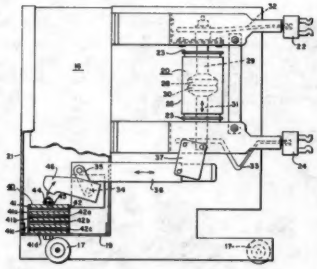
MULTIPLE-IMPACT SHOCK ABSORBING MEANS FOR CIRCUIT INTERRUPTER AND OTHER APPARATUS

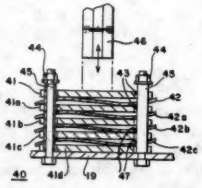
Stanislaw A. Milianowicz, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 13, 1984, Ser. No. 640,425

Int. Cl.[4] H01H *3/60*

U.S. Cl. 200—288 **10 Claims**





1. In combination with a circuit interrupter having a movable contact that is placed in make-circuit and break-circuit relationship with a stationary contact by an operating mechanism having movable parts, means for decelerating and arresting the motion of the movable contact and associated movable parts of the operating mechanism during the contact-opening stroke of the interrupter after the contacts have been separated, said means comprising:

a compressible shock-absorbing assembly that is mounted on a stationary part of the circuit interrupter support structure proximate a movable part of the interrupter operating

mechanism and comprises a plurality of discrete bodies of dense material that are disposed one upon another in loosely stacked array together with a plurality of interposed resilient components that maintain said discrete bodies in spaced-apart relationship when the shock-absorbing assembly is in relaxed non-compressed condition, said discrete bodies and interposed resilient components being freely movable toward and away from one another and said resilient components being adapted to collapse, when the shock-absorbing assembly is suddenly compressed, and permit adjacent discrete bodies to interact with one another in sequential impacting fashion and produce a series of monentum-exchange impacts between the discrete bodies,

means holding said discrete bodies and interposed resilient components in loosely-stacked freely-movable array, and

means for striking said shock-absorbing assembly coupled to said movable part of the interrupter operating mechanism and disposed to advance toward and move away from the shock-absorbing assembly during the contact-opening and contact-closing strokes, respectively, of the circuit interrupter in synchronism with the movement of the movable contact by said operating mechanism,

said compressible shock-absorbing assembly being so positioned that, at a predetermined time during the contact-opening stroke of the circuit interrupter, the advancing striker means hits the shock-absorbing assembly and moves along a path which initiates a series of sequentially-occurring impacting interactions and momentum exchanges between the respective freely-movable discrete bodies and the advancing striker means, with concomitant sequential compression and relaxation of the associated freely-movable resilient spacing means, which rapidly and progressively dissipates the kinetic energy generated by the operating mechanism and moving contact and thus quickly stops the advancing striker means and terminates the contact-opening stroke of the circuit interrupter,

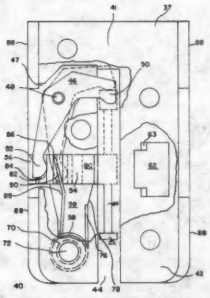
the resiliency of said interposed resilient components relative to the mass of the individual discrete bodies being such that the resilient components primarily serve as spacer means for the discrete bodies and thus do not substantially enhance the energy-dissipating capability of the compressible shock-absorbing assembly.

4,612,430

ANTI-REBOUND LATCH

Dallas Sloan, Cameron, Wis.; Donald R. Venzke, and Eugene Wehr, both of Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Dec. 21, 1984, Ser. No. 684,540
Int. Cl.[4] H01H *77/10*
U.S. Cl. 200—327 **15 Claims**



1. An anti-rebound latch assembly for controlling rebound movement of a blade which is movable through a defined path, said assembly comprising:

a housing having a first side leg, a second side leg and an opening between said first side leg and said second side leg to accommodate movement of said blade through said path;

a drive arm pivotally connected to said housing, said drive arm having a kicker portion extending into said opening and a pusher portion at its opposite end;

a blade catcher carried by said first side leg for reciprocal movement between a first position not extending into said opening and a second position extending across said opening; and

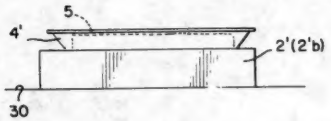
a spring biasinng said blade catcher toward said first position.

4,612,431

PACKAGE ASSEMBLY AND METHOD FOR STORING AND MICROWAVE HEATING OF FOOD

Richard K. Brown, Appleton, and Oscar E. Seiferth, Madison, both of Wis., assignors to James River - Norwalk, Inc., Norwalk, Conn.

Division of Ser. No. 637,057, Aug. 2, 1984, Pat. No. 4,555,605.
This application Jun. 21, 1985, Ser. No. 738,490
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 E **12 Claims**



1. A food package assembly for use in heating a predetermined quantity of food in a microwave oven having a support surface, comprising:

(a) heating means for converting microwave energy into heat, said heating means including a microwave interactive layer; and

(b) packaging means for combining together said heating means and the predetermined quantity of food in a package assembly constructed in a manner enabling it to be disposed in a first configuration for shipping and a second configuration for cooking, said package assembly in said first configuration having the quantity of food disposed within said packaging means without an enclosed air filled space being disposed under the quantity of food, for shipping and storage with a minimum of wasted space, and said package assembly in said second configuration having the quantity of food positionally rearranged relative to said heating means and said packaging means and with said quantity of food being supported in heat transfer relation with respect to said microwave interactive layer above an enclosed air filled space that is formed by at least a portion of said packaging means for promoting even cooking of the food when said portion of the packaging means is situated upon a support surface of a microwave oven.

4,612,432

ETCHING PLASMA GENERATOR DIFFUSOR AND CAP

Bradley A. Sharp-Geisler, San Jose, Calif., assignor to Monolithic Memories, Inc., Santa Clara, Calif.

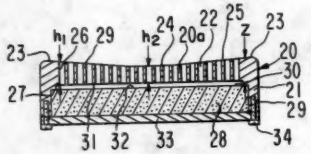
Filed Sep. 14, 1984, Ser. No. 651,192
Int. Cl.[4] B23K *9/00*; H01L *21/306*
U.S. Cl. 219—121 PG **11 Claims**

1. In a plasma generator wafer-etching machine having an rf emitting electrode, semiconductor wafer-mounting chuck spaced from said emitting electrode forming a plasma reaction

zone therebetween and wherein said emitting electrode includes a cap having multiple apertures and a gas diffusor within said cap, a top surface of said cap bounding one side of said zone and wherein said apertures are positioned to receive and convey an etching gas to said zone, the improvement comprising:

means operable at a given dark dspace thickness including a predetermined RF power level and a predetermined pressure of etching gas and including having said apertures of sufficient surface area for permitting a plasma sheath resultant from plasma formed in said zone to extend into said apertures from said zone while preventing extension of the plasma sheath from said cap to said diffusor; and

means for reducing sputtering of said cap by providing that said apertures are of such diameter and depth such that the plasma sheath area adjacent to the cap is maximized.



4,612,433

THERMAL HEAD AND MANUFACTURING METHOD THEREOF

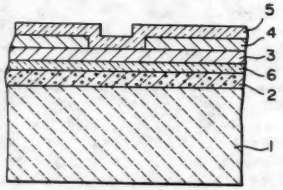
Makoto Nagaoka, Urawa, and Tetsuya Sugiyama, Soka, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,245

Claims priority, application Japan, Dec. 28, 1983, 58-251886; Apr. 11, 1984, 59-72412

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 219—216 **10 Claims**



1. A thermal head comprising a substrate, a glaze layer formed on said substrate, and a heat generating resistor and electrode means formed successively on said glaze layer, wherein said glaze layer is formed by printing on said substrate a glass paste of which the glass component comprises a glass powder composition of 20 to 100% by weight of a finely-divided glass powder having an average particle diameter of up to 5 μm and 0 to 80% by weight on the basis of the total amount of said glass powder composition of a glass powder having an average particle diameter of 8 to 20 μm, and by calcining said glass paste on said substrate to form a plurality of bubbles in said glaze layer.

4,612,434

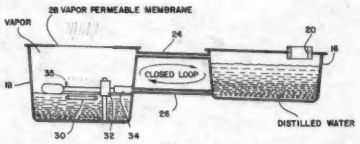
CLOSED LOOP HUMIDIFIER FOR INSTITUTIONS

Pingree Ianitelli, 11417 Savage Dr., Sterling Heights, Mich. 48077, and Kerry G. Fleury, 22400 Beechwood, East Detroit, Mich. 48021

Filed Nov. 13, 1984, Ser. No. 670,003

Int. Cl.⁴ F22B *1/28*

U.S. Cl. 219—273 **6 Claims**



1. A humidifier for providing an output of warm vapor, comprising;

a water storage compartment for receiving and holding a quantity of distilled water;

a vaporization compartment connected to said storage compartment through two lateral conduits, one above another, to provide a closed loop circulation between said compartments;

a vapor permeable panel included in an upper surface of the vaporization compartment; and

a means for heating water passed from the water storage compartment to the vaporization compartment to provide operation of the humidifier; and

said panel is of a microporous material of a fiber size and orientation that permits free passage of vapor molecules to ambient but not of larger water molecules.

4,612,435

ROLLER COUNTING DEVICE WITH ZERO RESET MECHANISM

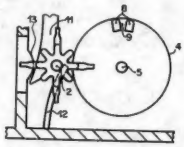
Roberto Polidoro, Geneva, Switzerland, assignor to Sodeco-Saia AG, Murten, Switzerland

Filed Jan. 17, 1985, Ser. No. 692,370

Claims priority, application Switzerland, Jan. 31, 1984, 435/84

Int. Cl.⁴ G06C *15/42*

U.S. Cl. 235—144 DM **6 Claims**



1. A roller counting device comprising

(a) at least one number bearing roller for maintaining a count starting from a zero setting;

(b) a first shaft on which said number bearing roller is rotatably mounted;

(c) at least one notched disk, said notched disk having a plurality of teeth and at least one arm extending outward therefrom:

(d) a second shaft extending parallel to said first shaft on which said notched disk is rotatably mounted;

(e) trip means mounted on said number bearing roller;

(f) spring means acting on said second shaft, said spring means tending to push said second shaft away from said first shaft; and

(g) slide means capable of selectively acting on said second

shaft to selectively push said second shaft toward said first shaft,

said counter being adapted to maintain a count when said slide means pushes said second shaft toward said first shaft against the force exerted by said spring means to cause said teeth of said notched disk to engage the surface of said number bearing roller so that said notched disk can cause said number bearing roller to move,

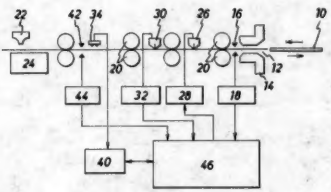
said counter being resettable to said zero setting when said spring means operates to force said second shaft away from said first shaft so that said teeth of said notched disk are disengaged from the surface of said number bearing roller and said number bearing roller is freely rotatable until said arm extending outward from said notched disk meets said trip means mounted on said number bearing roller.

4,612,436

READING AND WRITING APPARATUS FOR ID CARDS

Toshihiko Okada, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,162
Claims priority, application Japan, Aug. 1, 1983, 58-139503
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—449 **2 Claims**



1. An apparatus for the reading and writing with an identification card having at least one of a magnetic strip or an integrated circuit with connecting terminals; said apparatus comprising;

a magnetic writing head,

an integrated circuit connecting means disposed along a passage through which said identification card passes said magnetic reading head

said magnetic writing head being aligned with said magnetic strip incorporated within said identification card,

and said integrated circuit connecting means being aligned with said integrated circuit connecting terminals incorporated within said identification card so as to read and write with said identification card.

4,612,437

FOCUSSING ERROR DETECTING APPARATUS FOR USE IN AN OPTICAL DISC REPRODUCING DEVICE, AN AUTO-FOCUS CAMERA OR IMAGE-PICKUP DEVICE

Kiyoshi Ohsato, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,838
Claims priority, application Japan, Feb. 10, 1983, 58-21187
Int. Cl.[4] G11B *7/12*
U.S. Cl. 250—201 **15 Claims**

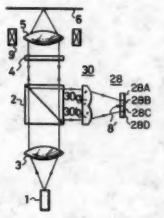
1. A focussing error detecting apparatus, comprising a compound lens and photodetector arranged in opposition thereto;

said compound lens having two lens regions with different back focal lengths separated by a boundary plane adapted to include an optical axis of light incident upon said compound lens;

said lens regions having respective optical axes which are spaced apart, and respective focal points spaced apart along said optical axes and at which light incident on said respective lens regions is focussed in the absence of any focussing error;

said photodetector having a photodetecting face positioned along said optical axis of light midway between said focal points;

said photodetecting face being comprised of first and second photodetecting element for receiving light passed through one of said lens regions at outer and inner sections, respectively, thereof with respect to said boundary plane, and third and fourth photodetecting elements for receiving



light passed through the other of said lens regions at outer and inner sections, respectively, thereof with respect to said boundary plane;

said first, second, third and fourth photodetecting elements producing first, second, third and fourth photodetecting signals, respectively, in response to the light respectively incident thereon; and

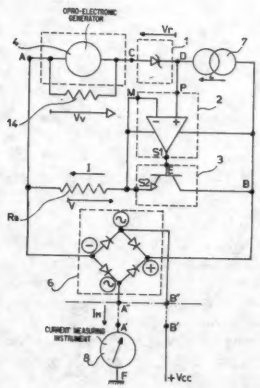
means for generating a focussing error signal dependent on a difference between a sum of said first and fourth photodetecting signals and a sum of said second and third photodetecting signals.

4,612,438

LIGHT INTENSITY SENSOR PROVIDING A VARIABLE OUTPUT CURRENT

Dominique Jacquel, Marnaz, France, assignor to Somfy, France

Filed Jan. 31, 1984, Ser. No. 575,841
Claims priority, application France, Feb. 4, 1983, 83 01759
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—206 **1 Claim**



1. A light intensity sensor adapted to provide a variable output current, which comprises:

an opto-electronic generator having first and second terminals, the opto-electronic generator being adapted to detect light and generate a voltage across the first and second

terminals thereof which varies as a function of the intensity of the detected light;

a voltage comparator, the comparator including an inverting input terminal, a non-inverting input terminal and an output terminal;

a loop resistor having first and second ends, the first end being electrically coupled to the first terminal of the opto-electronic generator, and the second end being electrically coupled to the inverting input terminal of the comparator;

a reference voltage generator having first and second terminals and being adapted to generate a reference voltage across the first and second terminals thereof, the first terminal of the reference voltage generator being electrically coupled to the second terminal of the opto-electronic generator, and the second terminal of the reference voltage generator being electrically coupled to the non-inverting input of the comparator; and

a current amplifier, the current amplifier having an input terminal and an output terminal, the input terminal of the current amplifier being electrically coupled to the output terminal of the comparator, and the output terminal of the current amplifier being electrically coupled to the inverting input of the comparator.

4,612,439

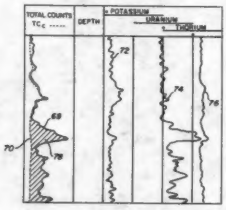
METHOD AND APPARATUS FOR NATURAL GAMMA RAY WELL LOGGING

David M. Chace, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 21, 1984, Ser. No. 581,637

Int. Cl.[4] G01V *5/06*

U.S. Cl. 250—256 **15 Claims**



1. A method for determining characteristics of subsurface earth formations said method including compensating natural gamma radiation signals for the effects of uranium, comprising the steps of:

detecting natural gamma radiations emanating from said earth formations;

generating an energy spectra signal functionally related to the energy and frequency of occurrence of said detected radiations;

determining a compensation factor functionally related to the relative contribution of uranium to said energy spectra signal; and

compensating said energy spectra signal using said compensation factor to remove substantially all the effects of uranium.

4,612,440

DEVICE FOR ADJUSTING SLIT WIDTHS IN SPECTROMETERS

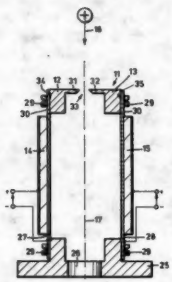
Curt Brunnée, Platjenwerbe; Peter Dobberstein, Bremen, and Günter Kappus, Stuhr, all of Fed. Rep. of Germany, assignors to Finnigan MAT GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,891

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332949

Int. Cl.[4] G01J *3/02*

U.S. Cl. 250—281 **18 Claims**



1. A device for adjusting the slit width of slit means in the beam path of a mass spectrometers for the analysis of organic or inorganic substances comprising:

a pair of slit jaws forming a set of slit means;

means for independently supporting said slit jaws near said beam path including a piezo-electric element for providing to and fro movement of at least one of said pair of slit jaws perpendicular to said beam path axis, said movement of one of said slit jaws being independent of said other slit jaw; and

means for applying a voltage across said piezo-electric element to controllably deflect said at least one of said jaws toward said beam path a predetermined distance to a new position and maintain said jaw in such position.

4,612,441

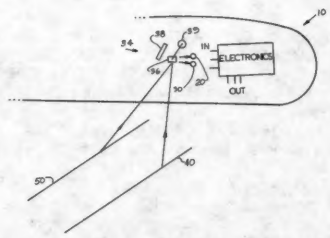
MOVING OBJECT DETECTION SYSTEM USING INFRARED SCANNING

Herman Pardes, Ocean, and William J. Mills, Oakhurst, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1984, Ser. No. 639,054

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—342 **7 Claims**



1. An infrared object detection system comprising:

optical scanning means in an aircraft moving in a longitudinal direction for continuously scanning along first and second transverse parallel paths on the ground,

first and second detectors positioned to receive infrared radiation from respective first and second paths, said

optical scanning means directing infrared radiation from objects in said first and second paths onto respective first and second detectors, said first path being spaced forwardly of said second path, said second path being substantially the same as said first path upon forward movement of said aircraft over said first path,

first electronic circuit means coupled to said first detector for generating a first signal containing information relating to objects on the ground in said first path which radiate a certain level of infrared radiation,

a first storage means for receiving and storing said first signal information along with information identifying the time and the location along said first path from which said first signal information originated,

second electronic circuit means coupled to said second detector for generating a second signal containing information relating to objects on the ground in said second path which radiate a certain level of infrared radiation,

a second storage means for receiving and storing said second signal information along with information identifying the time and the location along said second path from which said second signal information originated, and

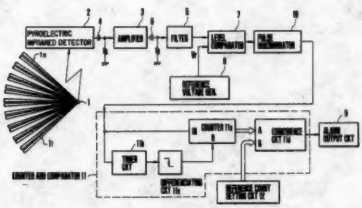
means for comparing the information in said first and second storage means to determine the presence or absence of the same information in each, the presence of the same information representing the presence of stationary objects in said first path and the presence of different information representing possible moving objects in said first path.

4,612,442

PASSIVE INFRARED INTRUSION DETECTION SYSTEM

Yasujima Toshimichi, Tokyo, Japan, assignor to King Tsushin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,789
Claims priority, application Japan, Jun. 10, 1983, 58-103906
Int. Cl.[4] G08B *13/18*
U.S. Cl. 250—353 **9 Claims**



1. A passive infrared intrusion detection system comprising:

a multi-faceted parabolic reflector which views a target monitored area as a plurality of optically divided detection zones, said reflector collecting infrared rays emitted from an object within the monitored area;

a passive infrared intrusion detector means combined with said reflector for detecting the collected infrared rays;

comparison means for comparing values of signals outputted by said intrusion detector means with a reference value;

pulse discriminator means connected to said comparison means for passing only pulses of said comparison means having a pulse width exceeding a predetermined pulse width so as to eliminate narrow noise pulses; and

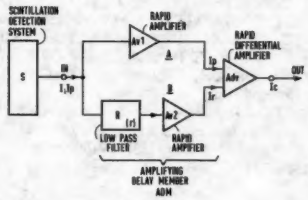
an alarm generating means including a counter for counting pulses outputted by said pulse discriminator means, and coincidence circuit means for generating an alarm signal only when the number of pulses received by said counter in a predetermined time interval exceeds a preset value.

4,612,443

METHOD AND DEVICE TO OVERCOME THE PILE-UP EFFECT IN SCINTILLATION COUNTERS

Mario Alcidi, Via Michelazzi 24, Florence, Italy

Filed Jan. 25, 1985, Ser. No. 695,116
Claims priority, application Italy, Jan. 27, 1984, 9322 A/84
Int. Cl.[4] G01T *1/208*
U.S. Cl. 250—362 **19 Claims**



1. A method for overcoming the pile-up effect in a scintillation detection system which produces original electrical pulses in response to impinging radiation, comprising the steps of:

(a) deriving from each original electrical pulse a low-pass filtered and delayed version thereof, said version having, with respect to its corresponding original electrical pulse, a delayed rising wavefront and an otherwise substantially similar waveform; and

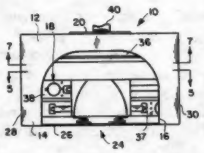
(b) performing subtractions between original electrical pulses and corresponding delayed versions thereof, thereby forming differential output pulses.

4,612,444

APPARATUS FOR CURING BONDING MATERIAL OF ARTIFICIAL NAIL TIPS

Vincent J. Ragusa, 123 Avenue B. S.W., Winter Haven, Fla. 33880

Filed Jul. 31, 1985, Ser. No. 760,938
Int. Cl.[4] G21K *5/08*
U.S. Cl. 250—492.1 **9 Claims**



1. An apparatus for curing an ultraviolet curable coating and bonding material applied to the fingernail surfaces and thumbnail surfaces of a person upon the application of electrical power comprising in combination:

an enclosure having an opening therein for receiving the hands of a person;

a plurality of lamps disposed within the enclosure for emitting ultraviolet light for curing the ultraviolet curable material applied to the fingernail surfaces and thumbnail surfaces of the hand of the person;

an electrical timer switch interposed between the power source and the plurality of lamps for controlling electrical power to the plurality of lamps in accordance with a preselected duration of said electrical timer switch;

finger guide means disposed within said enclosure for locating the hand of the person with the fingernail surface of the fingers being disposed along a first region and with the thumb nail of the person being located in a second region; and

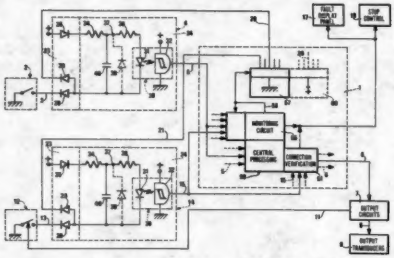
said plurality of lamps being disposed within said enclosure for irradiating the fingernail surfaces of the person and the thumb nail surface of the person for producing simultaneously and uniform curing of the fingernail surfaces and the thumb nail surfaces.

4,612,445

SYSTEM FOR MONITORING THE OPERATION OF INPUT CIRCUITS TO A CENTRAL CONTROL AND MONITORING UNIT FOR MACHINES AND/OR DEVICES USABLE IN PRODUCTION AND/OR PRODUCT PACKAGING LINES

Armando Neri, Bologna, Italy, assignor to G.D. Societa Per Azioni, Bologna, Italy

Filed Dec. 28, 1983, Ser. No. 566,368
Claims priority, application Italy, Feb. 15, 1983, 3335 A/83
Int. Cl.⁴ G08B *29/00*
U.S. Cl. 250—551 **5 Claims**



1. Apparatus for controlling and monitoring a manufacturing or packaging line, comprising:

a plurality of input circuits have identical circuit configurations, each providing an operation selected from the group consisting of:

(a) integrator means for eliminating disturbing signals fed to the input circuit,

(b) a high pass filter for passing AC signals fed to the input circuit, and

(c) rectifier means for rectifying AC signals fed to the input circuit,

each of said circuit configurations having a plurality of terminals arranged for connection to devices for controlling or monitoring the manufacturing or packaging line, the connection between the terminals and devices being selectable in accordance with the type of operation employed;

a central control unit connected to said input circuits; and

means connected to said input circuits for detecting possible defects in the operation of said input circuits, wherein said detecting means includes means for sending test signals to said input circuits, said test signals being operable to cause changes of logic level in the signals sent by said input circuits to said central unit and wherein said detecting means further includes means for detecting said changes of logic level and for discriminating whether or not said changes are the result of sending said test signals.

4,612,446

WEB TERMINAL DETECTING DEVICE

Kenji Suzuki, Shizuoka, Japan, assignor to Star Seimitsu Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 14, 1984, Ser. No. 651,215
Claims priority, application Japan, Sep. 14, 1983, 58-168421
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 250—570 **4 Claims**

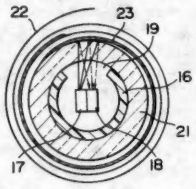
1. A web terminal detecting device comprising:

a housing for accommodating therein a web wound upon a hollow winding core;

a hollow fixed shaft provided on said housing for rotatably supporting said winding core of the web, said fixed shaft having a light transmitting portion at a portion of the periphery thereof;

a light reflecting member provided on the terminal of the web and having a length sufficient to cover at least said light transmitting portion of said fixed shaft; and

detecting means positioned in said hollow fixed shaft for



detecting said light reflecting member, said detecting means having a light emitting section for radiating light towards said light transmitting portion and having a light receiving section for receiving the light reflected by said light reflecting member,

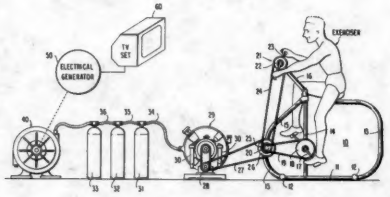
Wherein as said light reflecting member is unwound and released from said winding core, the light from said light emitting section passes through said light transmitting portion to the outside of said winding core, and the terminal of said web is detected by sensing that no reflected light is received by said light receiving section.

4,612,447

METHOD AND APPARATUS FOR CONVERTING HUMAN EXERCISE ENERGY TO STORED KINETIC ENERGY

Eugene T. Rowe, 314 Colonel Dr., Highland Springs, Va. 23075

Filed Sep. 7, 1983, Ser. No. 529,912
Int. Cl.⁴ F03G *5/06*
U.S. Cl. 290—1 R **3 Claims**



1. Apparatus for storing normally uselessly dissipated human energy and converting the stored energy to a useful energy form comprising,

a human operatable crank means and shaft rotated thereby,

an air compressor means operated by said shaft,

a plurality of high pressure air storage vessels connected to said air compressor, and

means for sequentially connecting each said high pressure air storage vessel to said air compressor to sequentially fill each high pressure air storage vessel with air from said air compressor to a selected storage pressure,

air motor means connected to said high pressure air storage vessels, and

means for connecting each filled said high pressure storage vessel in sequence to said air motor means to supply high pressure air thereto, each succeeding of said high pressure air storage vessels which is filled being connected to said

air motor means automatically upon the pressure of a preceeding high pressure air storage vessel reaching a predetermined low pressure.

4,612,448
ELECTRONIC SWITCH

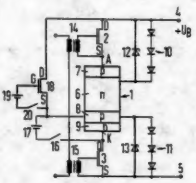
Helmut Strack, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 698,000

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413666

Int. Cl.⁴ H03K *17/72*

U.S. Cl. 307—252 G **4 Claims**



1. An electronic switch of the thyristor type having four zones of alternating conductivity types and a first IGFET is connected in series, the electric switch comprising:

(a) a second IGFET being connected in series with the thyristor at its anode terminal,

(b) the second IGFET being connected across an outer anode-side zone of the electronic switch and a second terminal of the electronic switch,

(c) the first IGFET being connected across an outer cathode-side zone of the electronic switch and a third terminal of the electronic switch,

(d) an inner anode-side and an inner cathode-side zones being provided with a separate connection for each,

(e) a first threshold circuit being connected between the connection of the inner anode-side zone and the second terminal

(f) a second threshold circuit being connected between the connection of the inner cathode-side zone and the third terminal and

(g) the first and second threshold circuits having a higher threshold voltage than the p-n junctions between the two anode-side and the cathode-side zones including the forward resistance of the first and second IGFETs connected with the outer anode-side and cathode-side zones.

4,612,449
THYRISTOR HAVING A SECONDARY EMITTER ELECTRODE AND A METHOD FOR OPERATING THE SAME

Hubert Patalong, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 22, 1980, Ser. No. 199,520

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945347

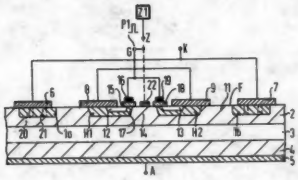
Int. Cl.⁴ H03K *19/60*

U.S. Cl. 307—252 C **7 Claims**

1. In a thyristor structure of the type in which a semiconductor body includes first and second base layers adjacent and contacting one another, a p-emitter layer contacting the first base layer, a first electrode contacting the p-emitter layer, an auxiliary n-emitter layer contacting the second base layer, a second electrode contacting the auxiliary n-emitter layer and bridging the pn junction between the second base layer and the auxiliary n-emitter layer, an n-emitter layer contacting the second base layer and a third electrode contacting the n-emitter layer, the improvement comprising:

at least one current path which can be turned off comprising a metal-insulator-semiconductor structure located at the boundary surface of the semiconductor body which carries the second elecctrode, said metal-insulator-semiconductor structure including

first and second semiconductor regions of a first conductivity type spaced apart, said first region connected to



the second base layer, said second region connected to the second electrode,

a third semiconductor region of an opposite second conductivity type intermediate said first and second regions,

an insulated gate covering said third region, a control voltage terminal connected to said gate, and portions of the second base layer extending through the n-emitter layer and contacting the third electrode at the boundary surface.

4,612,450
METHOD OF SETTING A REFERENCE VALUE, FOR EXAMPLE TO ZERO-SET A SIGNAL SOURCE, PARTICULARLY A TRANSDUCER

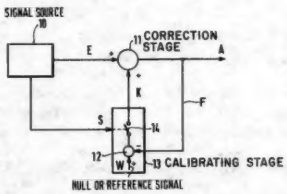
Günter Gilz, Korschenbroich, and Manfred Henning, Kaurst, both of Fed. Rep. of Germany, assignors to Bosch und Pierburg System Ohg, Neuss, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,499

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312027

Int. Cl.⁴ H03K *5/00*

U.S. Cl. 307—264 **8 Claims**



1. A method, of calibrating a signal source by adjusting its output signal (E) to a desired reference value (W) particularly of setting a zero output signal of a transducer apparatus disposed in a zero position, comprising the steps of

initially passing said source output signal (E) essentially unchanged through a correction stage (11) to produce a system output signal (A);

providing a reference signal (W);

comparing said system output signal (A) to said reference signal (W) and determining whether they have equal values;

if said values are unequal, providing a correction signal (K) as a function of the comparison between the system output signal (A) and the reference signal (W), and setting the value of said correction signal (K) into said correction stage (11);

combining said correction signal (K) and said source output signal (E) in said correction stage (11) to produce a modified system output signal (A);

comparing said modified system output signal (A) to said reference signal (W) to determine whether they have equal values;

and, if said values are equal, maintaining said correction signal (K) value setting in said correction stage (11) and ceasing application of further correction signals thereto.

4,612,451

DRIVE CIRCUIT FOR DRIVING A TRANSISTOR

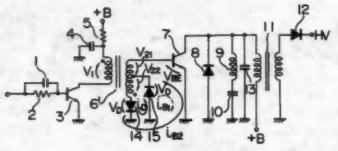
Hitoshi Maekawa; Michitaka Osawa, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,309

Claims priority, application Japan, Feb. 25, 1983, 58-29302

Int. Cl.[4] H03K *17/00*; H03B *41/00*

U.S. Cl. 307—270 **4 Claims**



1. A drive circuit for performing a switching operation on a transistor, comprising:

a coupling transformer having primary and secondary windings, one end of said secondary winding being coupled to a base of said transistor for feeding base current into said tansistor, and said transistor being driven through said primary winding of said transformer;

a tap provided on said secondary winding; and

a directional element connected between said tap and the other end of said secondary winding, said directional element being so arranged that a forward base drive current is supplied to said transistor from said one end and said tap of said secondary winding and a reverse base drive current is supplied to said transistor from said one end and the other end of said secondary winding.

4,612,452

CONTROL CIRCUIT FOR THE SWITCHING OF INDUCTIVE LOADS HAVING A PUSH-PULL OUTPUT STAGE

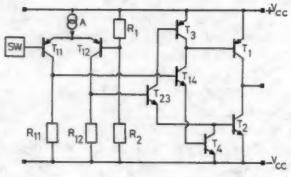
Fabrizio Stefani, Cardano al Campo; Carlo Cini, Cornaredo, and Angelo Alzati, Bollate, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Agrate Brianza, Italy

Filed Mar. 17, 1983, Ser. No. 476,374

Claims priority, application Italy, Mar. 17, 1982, 20213 A/82

Int. Cl.[4] H03K *3/33, 17/60*

U.S. Cl. 307—300 **7 Claims**



3. A monolithicaly integratable control circuit for switching inductive loads and having a push-pull output stage, said circuit comprising:

first and second active circuit means each having a first terminal, a second terminal and a control terminal, and each of said first and second active circuit means having at least a first state in which said means is conductive and a second state in which said means is non-conductive, each of said active circuit means being operatively connected between first and second terminals of a supply voltage generator, and said control terminals of said active circuit means being connected to a supply source by means of a control circuit means which is connected to a switching signal source, said control circuit means alternately rendering said first and second active circuit means conductive in response to said switching signal source;

wherein said circuit means comprises a third and a fourth active circuit means for the withdrawal of charges, each of said third and fourth active circuit means having at least a first state in which said means is conductive and a second state in which said means is non-conductive, said third and fourth active circuit means being respectively connected to said control terminals of said first and second active circuit means and being operatively connected to said control circuit means which controls said third and fourth active circuit means for the withdrawal of corresponding charges from said second and first active circuit means, and wherein said third active circuit means is rendered conductive by said control circuit means for a specified period of time having a duration which is equal to or greater than a duration of a period of time during which said second active circuit means is rendered conductive by said control circuit means, and wherein said fourth active circuit means is rendered conductive by said control circuit means for a specified period of time having a duration which is equal to or greater than a duration of a period of time during which said first active circuit means is rendered conductive by said control circuit means;

wherein said first and second active circuit means comprise transistors.

4,612,453

INTEGRATED CIRCUIT DEVICE HAVING A CIRCUIT MEANS FOR DETECTING A DISCONNECTION OF INPUT SIGNAL LINE

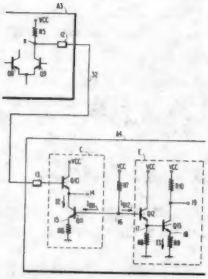
Yuetsu Yamazaki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,255

Claims priority, application Japan, Feb. 10, 1982, 57-19906

Int. Cl.[4] H03K *3/26, 5/153, 5/19*

U.S. Cl. 307—303 **9 Claims**



1. A semiconductor integrated circuit including a circuit for detecting disconnection of a signal line from an input terminal, said detecting circuit comprising:

first and second power terminals, a power voltage being supplied between said first and second power terminals;

an emitter follower transistor (Q10) having a base d.c. coupled to said input terminal, a collector d.c. coupled to said

first power terminal and an emitter said emitter follower transistor transferring a signal at said input terminal to its emitter;

a load transistor (Q11) for said emitter follower transistor having a collector d.c. coupled to the emitter of said emitter follower transistor, an emitter d.c. coupled to said second power terminal and a base;

a means (R7) for supplying a base current for said load transistor, said supplying means being inserted between said first power terminal and the base of said load transistor; and

a detection output circuit powered by said power voltage and having an input port receiving the potential at the base of said load transistor, and an output port producing a first output potential when said signal line is connected to said input terminal and a second output potential different from said first output potential when said signal line is not connected to said input terminal.

4,612,454

METHOD FOR CONTROLLING SIGNAL INTEGRATION TIME OF A SIGNAL INTEGRATION TYPE IMAGE SENSING DEVICE

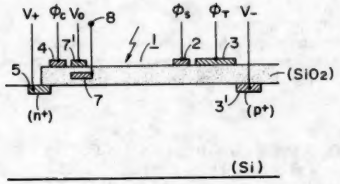
Takao Kinoshita, Tokyo; Tokuichi Tsunekawa, and Yuichi Sato, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 324,435, Nov. 24, 1981, abandoned. This application May 24, 1984, Ser. No. 613,768

Claims priority, application Japan, Dec. 2, 1980, 55-170626

Int. Cl.⁴ H03K *3/42;* **H01L** *29/78, 27/14, 31/00*

U.S. Cl. 307—311 **5 Claims**



1. An image sensing system comprising: p1 an image sensing device including:

a plurality of radiation-sensitive elements, each of which generates a signal corresponding to incident radiation and stores and integrates the respective generated signal;

readout means for reading out the integrated signals from said radiation-sensitive elements;

a plurality of separate detecting means for detecting the respective amounts of the integrated signals at respective ones of said radiation-sensitive elements, each of said detecting means producing an indication of the respective detected amount; and

clear means for clearing the signals from each of said radiation-sensitive elements; and

control means for controlling said readout means based on a maximum indication from among the indications produced by said detecting means,

wherein each of said detecting means is associated with at least a part of one of said radiation-sensitive elements, respectively, and wherein each of said detecting means includes a floating gate.

4,612,455

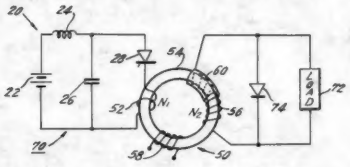
DISTRIBUTED PULSE FORMING NETWORK FOR MAGNETIC MODULATOR

Maurice Weiner, Ocean; John L. Carter, Belmar, and Robert J. Youmans, Point Pleasant, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1984, Ser. No. 608,840

Int. Cl.⁴ H03K *3/00*

U.S. Cl. 307—419 **13 Claims**



1. A magnetic modulator for forming pulses, comprising:

a magnetic core for conducting magnetic flux;

a primary inductor on the magnetic core for inducing a magnetic flux in the magnetic core;

a secondary inductor on the core for receiving induced energy in response to the magnetic flux induced by the primary inductor; and

a pulse forming network including a tertiary inductor and a capacitive element on the magnetic core, said tertiary inductor being connected to one end of said secondary inductor, said network receiving and storing the induced energy from the secondary inductor and providing the stored energy as a pulse.

4,612,456

APPARATUS AND METHOD FOR GENERATING LIGHT HAVING A WAVELENGTH IN THE RANGE OF APPROXIMATELY 250–550 NANOMETERS

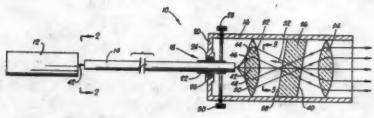
John S. Gergely, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 2, 1982, Ser. No. 414,405

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.⁴ G02F *1/35*

U.S. Cl. 307—425 **8 Claims**



1. Apparatus for generating ultraviolet light at a remote position comprising:

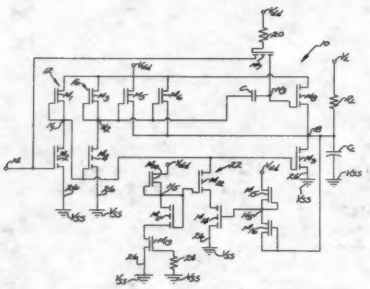
a source of linearly polarized light having a wavelength range of about 500 to 1100 nanometers;
a non-linear crystal;
an optical fiber having one end positioned adjacent said light source to permit transmission of said light within said fiber and the other end positioned adjacent said crystal to receive transmitted light therethrough;
a pair of lenses, one lens interposed between the other end of said fiber and said crystal and the other placed adjacent said crystal in the path of light emerging therefrom; and
index-matching fluid having an index of refraction that is substantially the same as said lenses and said crystal, said fluid occupying the space between said lenses in envelopment of said non-linear crystal;
whereby light emanating from said non-linear crystal is much increased in frequency relative to the linearly polarized light from said source.

4,612,457

CURRENT LIMITING OUTPUT BUFFER FOR INTEGRATED CIRCUIT

Cordell E. Prater, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 27, 1983, Ser. No. 508,311
Int. Cl.[4] H03K *17/12, 19/094*
U.S. Cl. 307—443 **5 Claims**



1. An MOS integrated circuit having circuit means for providing selected current levels at an output of the integrated circuit, the circuit means comprising MOS source current transistor means having transistor drain and source and gate means connected to the integrated circuit output and source supply means respectively, having buss means connected with said circuit means with current capacity relatively less than said selected current levels, and having voltage-responsive current-limiting MOS means for limiting operation of said circuit means for limiting said cirduit current levels within the capacity of said circuit buss means, said current-limiting means comprising means for limiting gate voltage applied to said source current transistor gate means for limiting current provided by said transistor means and having switching means for inactivating the current-limiting means under selected circuit operating conditions for permitting operation of said source current transistor means at full current producing capability under said selected operating conditions.

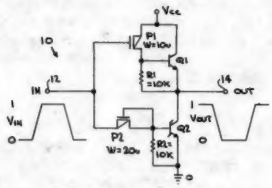
4,612,458

MERGED PMOS/BIPOLAR LOGIC CIRCUITS

Nader Vasseghi, Mountain View, and Donald G. Goddard, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 28, 1985, Ser. No. 770,817
Int. Cl.[4] H03K *19/08, 19/003, 17/16, 17/56*
U.S. Cl. 307—446 **10 Claims**

1. An inverter circuit formed of merged P-channel MOS transistors and bipolar transistors to produce a single logic gate comprising:
a first P-channel MOS transistor having its gate connected to an input terminal and its source connected to a supply potential;
a first bipolar transistor having its collector connected to the supply potential, its base connected to the drain of said first P-channel transistor, and its emitter connected to an output terminal;
a first resistor having its one end connected to the drain of said first P-channel transistor and to the base of said first bipolar transistor, the other end of said first resistor being



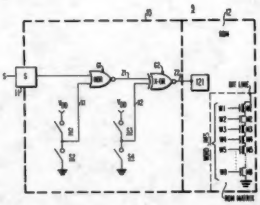
connected to the emitter of said first bipolar transistor and to the output terminal;
a second P-channel MOS transistor having its gate and source connected together and its drain connected to the gate of said first P-channel transistor and to the input terminal;
a second bipolar transistor having its collector connected to the output terminal, its base connected to the gate and source of said second P-channel transistor, and its emitter connected to a ground potential; and
a second resistor having its one end connected to the base of said second bipolar transistor and its other end connected to the emitter of said second bipolar transistor.

4,612,459

PROGRAMMABLE BUFFER SELECTIVELY SETTABLE TO OPERATE IN DIFFERENT MODES

Robert G. Pollachek, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1984, Ser. No. 615,557
Int. Cl.[4] H03K *17/693, 19/096*
U.S. Cl. 307—468 **9 Claims**



1. A programmable buffer comprising:
an input terminal for receiving different valued input signals;
an output terminal for producing thereat a "standard" enabling signal of first value;
control means for producing first and second control signals having either binary value;
first and second means, each one of said first and second means having first and second inputs and an output;
means connecting the first input of said first means to said input terminal and its second input to said control means; said first means being responsive to one binary value of said first control signal for producing at its output a signal which is the inverse of the signal at said input terminal and

being responsive to said other binary value of said first control signal for then producing at its output a signal having only one of said binary values regardless of the value of said input signal; and

means connecting said first input of said second means to said output of said first means, its second input to said control means and its output to said output terminal; said second means being responsive to the output of said first means and to said second control signal for producing a signal at its output having one binary value when the signals at its first and second inputs have the same binary value and for producing a signal at its output having the other binary value when the signals at its first and second inputs have different binary values;

said first and second means being responsive to said first and second control signals for producing said standard enabling signal of first value at said output terminal in response to either of the following:

(a) a signal at said input terminal having a first value for one condition of said control signals; or

(b) a signal at said input terminal having a different value than said first value for a second condition of said control signals; or

(c) regardless of the value of the input signal at said input terminal for a third condition of said control signals.

4,612,460

CIRCUIT FOR TRANSLATING SIGNAL LEVELS BETWEEN A LOGIC OF THE SATURATED TYPE AND A LOGIC OF THE NON-SATURATED TYPE

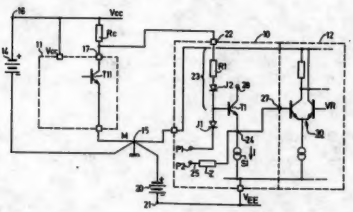
Gilbert Y. M. Gloaguen, Tourville sur Odon, and Michel Moussie, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1983, Ser. No. 541,946

Claims priority, application France, Oct. 18, 1982, 82 17397

Int. Cl.⁴ H03K *19/092, 19/003*

U.S. Cl. 307—475 **12 Claims**



1. A circuit **(10, 100)** for translating signal levels between a first logic family type circuit **(11)** of the saturated type characterized by having two output signal levels and which is driven by a first d.c. supply source **(14)** of which one terminal **(15)** constitutes a common reference potential point **(M)**, and a second logic family type circuit **(12, 120, 200)** of the non-saturated type characterized by having two other output signal levels and which is driven by a second d.c. supply source **(20)** of which one terminal is connected to the common reference potential point **(M)** and the other terminal **(21)** provides a voltage (V_{EE}) having a polarity opposite to that of the first d.c. supply source; such translator circuit having a transit terminal **(22)** for receiving the output signals of the first logic circuit **(11)** which are to be translated into signals at an output terminal **(27)** of the translator circuit at a level suitable for the input of the second logic circuit; characterized in that said translator circuit comprises:

an emitter follower transistor **(T1)**, whose base is connected to a first point **(P1)** of the circuit at a given potential with respect to that of the common reference point **(M)** via a first forward semiconductor junction **(J1)**, the base further being connected to the transit terminal **(22)** via a current-limiting element **(23)**,

a constant current source **(S1)** connected between the said other terminal of the second supply source **(20)** and the emitter of the emitter follower transistor **(T1)**,

and a load element (Z, R, J, T_Z) for the constant current source **(S1)**, of which a first connection **(24)** is connected to the emitter of the emitter follower transistor and a second connection **(25)** is connected to a second point **(P2)** of the circuit at a given potential with respect to that of the common reference point **(M)**,

the said first connection **(24)** of the load element constituting the output terminal **(27)** of the translator circuit for supplying the signals for the input of the second logic circuit, one level of these signals being determined on the basis of the potential of the said second point **(P2)** of the translator circuit by the voltage drop in the load element (Z, R, J, T_Z) traversed by the current (I) of the constant source **(S1)**, the emitter followed transistor **(T1)** being cut off, while the other level is determined by the potential of the emitter of the emitter follower transistor **(T1)**, the emitter follower transistor **(T1)** then being conducting.

4,612,461

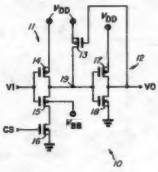
HIGH SPEED INPUT BUFFER HAVING SUBSTRATE BIASING TO INCREASE THE TRANSISTOR THRESHOLD VOLTAGE FOR LEVEL SHIFTING

Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 9, 1984, Ser. No. 578,718

Int. Cl.⁴ H03K *17/30, 19/096*

U.S. Cl. 307—475 **5 Claims**



1. In a CMOS integrated circuit in which N channel transistors are formed in P-wells at least one of which has means for receiving a back bias of a first voltage, an input buffer comprising:

a first P channel transistor having a first current electrode coupled to a first power supply terminal, a control electrode for receiving an input signal generated externally from the CMOS integrated circuit, and second current electrode;

a first N channel transistor, formed in a P-well having means for receiving a back bias of a second voltage which is more negative than the first voltage, having a first current electrode coupled to the second current electrode of the first P channel transistor, a control electrode for receiving the input signal, and a second current electrode coupled to a second power supply terminal;

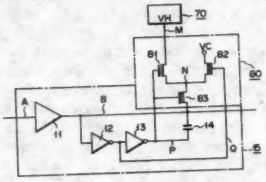
a second P channel transistor having a first current electrode coupled to the first power supply terminal, a control electrode coupled to the second current electrode of the first P channel transistor, and a second current electrode for providing an output signal; and

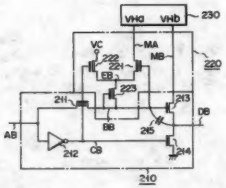
a second N channel transistor, formed in a P-well having means for receiving the back bias of the first voltage, having a first current electrode coupled to the second current electrode of the second power supply terminal, a control electrode coupled to the control electrode of the second P channel transistor, and a second current electrode coupled to the second power supply terminal.

4,612,462
LOGIC CIRCUIT HAVING VOLTAGE BOOSTER

Masamichi Asano, Tokyo, and Hiroshi Iwahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 21, 1983, Ser. No. 487,024
Claims priority, application Japan, Apr. 24, 1982, 57-68921
Int. Cl.[4] H03K *19/003, 19/017, 19/094, 17/10*
U.S. Cl. 307—482 21 Claims





1. A logic circuit comprising:

voltage boosting means connected to a power source voltage, said voltage boosting means receiving an input signal and having an output for supplying an output signal, said voltage boosting means being constructed and arranged so that the voltage level of said output signal is boosted above the level of said power source voltage when said input signal changes to a predetermined level;

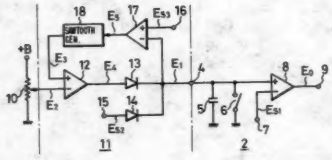
voltage retaining means having an output end for outputting an auxiliary voltage higher than said power source voltage; and

switching means connected between said output end of said voltage retaining means and said voltage boosting means and being responsive to said boosting operation of said voltage boosting means to connect said auxiliary voltage to said output of said voltage boosting means.

4,612,463
INTERFACE CIRCUIT

Kazuo Kikuchi, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 19, 1984, Ser. No. 590,686
Claims priority, application Japan, May 19, 1983, 58-73768[U]
Int. Cl.[4] H03K *3/017, 5/153*
U.S. Cl. 307—490 3 Claims



1. An interface circuit for connecting a low-resistance analog voltage output device, such as a tablet, to an analog input circuit, such as for a computer, of the type having an input terminal connected to a capacitor, a comparator for comparing an input signal to a first reference voltage, and means for discharging the capacitor at predetermined time intervals, comprising:

a sawtooth generator for providing a sawtooth voltage;

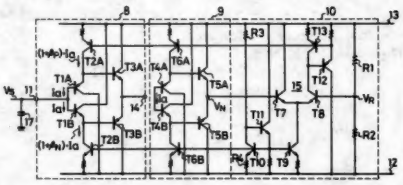
an interface comparator having an input terminal for receiving said analog voltage of said low-resistance analog voltage output device and comparing it to said sawtooth voltage, and for providing an output signal to an output terminal of low level when said analog voltage is lower than said sawtooth voltage and of high level when said analog voltage is higher than said sawtooth voltage, said output terminal of said interface comparator being connected to said input terminal of said analog input circuit; and

reset means for detecting said discharging of said capacitor of said analog input circuit and resetting said sawtooth generator at said predetermined time intervals.

4,612,464
HIGH SPEED BUFFER CIRCUIT PARTICULARLY SUITED FOR USE IN SAMPLE AND HOLD CIRCUITS

Fumio Ishikawa, and Kuninobu Tanaka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1984, Ser. No. 573,636
Claims priority, application Japan, Jan. 28, 1983, 58-9989[U]
Int. Cl.[4] H03K *17/06, 17/04, 17/60, 3/26*
U.S. Cl. 307—496 3 Claims



1. A high input impedance circuit comprising:

main buffer circuit means, dummy circuit means and feedback circuit means;

each of said main buffer circuit means and said dummy circuit means including a first pair of NPN and PNP transistors and a second pair of NPN and PNP transistors, each of said transistors having a base, emitter and collector, said bases of said first pair of transistors being connected to each other, said emitters of said second pair of transistors being connected to each other, said emitters of said PNP and NPN transistors of said first pair being connected to said bases of said NPN and PNP transistors, respectively, of said second pair, and first and second constant current circuits connected to said emitters of said PNP and NPN transistors, respectively, of said first pair;

power source means of first and second opposed polarities connected to said collectors of said NPN and PNP transistors, respectively, of each of said first and second pairs of transistors;

input means connected to the connected together bases of said first pair of transistors of said main buffer circuit means;

output means connected to the connected together emitters of said second pair of transistors of said main buffer circuit means; and

said feedback circuit means includes first and second constant current source circuits for driving said first and second constant current circuits, respectively, of said main buffer circuit means and of said dummy circuit means, and control circuit means for controlling an amount of a current of at least one of said first and second constant current source circuits so as to achieve substantial equality of a

voltage at the connected together emitters of said second pair of transistors in said dummy circuit means with a reference voltage and thereby causing the voltage at said output means to vary with any voltage changes at said input means without requiring any current flow from said input means.

4,612,465

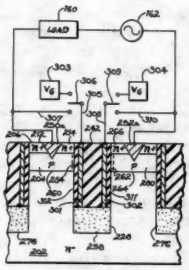
LATERAL BIDIRECTIONAL NOTCH FET WITH GATES AT NON-COMMON POTENTIALS

Herman P. Schutten, Whitefish Bay; Robert W. Lade, Milwaukee, and James A. Benjamin, Waukesha, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 390,473, Jun. 21, 1982, Pat. No. 4,546,367. This application May 13, 1985, Ser. No. 734,031

Int. Cl.[4] H03K *17/687*

U.S. Cl. 307—584 **3 Claims**



3. A bidirectional FET comprising:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of said one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

a notch extending downwardly between and separating said first and second source regions and said first and second channel regions, and extending downwardly into said drift region;

insulated split gate means in said notch comprising a left gate electrode extending vertically within said notch proximate said first channel region and a right gate electrode extending vertically within said notch proximate said second channel region, said right gate electrode being insulated between said left gate electrode and the right side edge of said notch, and said left gate electrode being insulated between said right gate electrode and the left side edge of said notch, said gate electrodes being adapted for application of electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first and second channel regions;

first and second main electrodes each connected to a respective said source region and channel region;

whereby upon application of voltage of either polarity to said first and second main electrodes from an AC power source, electric current can flow in a respective corresponding direction between said main electrodes, under control of said electrical potential of said gate electrodes, the conductive current through said drift region traversing along one side of said notch then around the bottom end thereof then along the other side of said notch;

said FET having an OFF state in the absence of said electrical gate potential, with the junction between said drift region and one of said channel regions blocking current flow toward one of said source regions and in its respective said main electrode, and with the junction between said drift region and the other of said channel regions blocking current flow toward the other of said source regions and its respective said main electrode, said single drift region around said notch supporting OFF state blocking voltage in both directions; and

means connecting said left gate electrode to said first main electrode in said OFF state for both half cycles of said AC source, and means connecting said right gate electrode to said second main electrode in said OFF state for both half cycles of said AC source,

such that during the first half cycle of said AC source during said OFF state of said FET, voltage rises positively at said second main electrode relative to said first main electrode, and the potential in said second channel region and said drift region likewise rises positively, the potential in said drift region along said right side of said notch also rising positively, said left gate electrode being negative due to said means connecting said left gate electrode to said first main electrode, said relatively negative left gate electrode establishing an electric field gradient between itself and the relatively positive said drift region across said notch, said electric field gradient causing attraction of carriers in said drift region toward the right edge of said notch below said second channel region due to the attraction from said relatively negative left gate electrode and the electric field gradient thereto, migration of minority carriers into said drift region along said right edge of said notch causing depletion of majority carriers out of said right notch edge drift region portion which in turn may invert the conductivity type of such region if the concentration of minority carriers becomes great enough to form an induced conductive channel around said drift region and in turn cause said FET to lose its OFF state voltage blocking capability, said right gate electrode shielding said right notch edge drift region portion from the electric field gradient from said left gate electrode by being at substantially the same potential as said second main electrode and hence be relatively positively biased, said right gate electrode being between said left gate electrode and said right notch edge drift region portion to shield the latter from the effects of said relatively negative left gate electrode and the electric field gradient thereto whereby to prevent depletion and unwanted inducement of conduction channels in said drift region during said OFF state,

and such that in the other half cycle of said AC source during said OFF state with said first main electrode rising positively relative to said second main electrode, said left gate electrode is insulated between the relatively negative said right gate electrode and the left notch edge drift region portion and shields the latter from electric field gradient induced depletion.

4,612,466

HIGH-SPEED OUTPUT DRIVER

Roger G. Stewart, Hillsborough Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 31, 1984, Ser. No. 646,102

Int. Cl.[4] H03K *17/04, 17/687, 19/017, 5/12*

U.S. Cl. 307—585 **12 Claims**

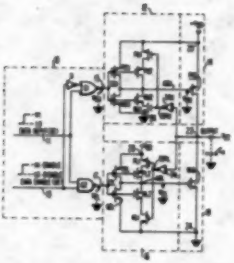
1. The combination comprising:

a signal input terminal adapted to receive input signals having a first or a second value;

an output stage having a signal input and a signal output;

amplifying means coupled between said input terminal and

said signal input of said output stage for driving said output stage and for producing at said signal output either a first level in response to one value of said input signal or a second level in response to the other value of said input signal, said amplifying means being settable to either a first condition for which it responds faster to an input signal transition from said first to said second value than to a transition from said second to said first value, or to a



second condition for which it responds faster to an input signal making a transition from said second to said first value; and

feedback means coupled between said signal output and said amplifying means responsive to the level at said signal output for setting said amplifying means to either one of said first and second conditions, depending on the level at said signal output.

4,612,467

ELECTROMAGNETIC RECIPROCATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Jan. 16, 1985, Ser. No. 691,782

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—27 **1 Claim**

1. An electromagnetic reciprocator comprising in general a permanent magnet which receives a direct electric current from a helical charging coil and converts the current into a magnetic field, and a helical discharging coil which reciprocates through the magnetic field and induces an alternating electric current therefrom, as means of storing and retrieving electricity; and comprising in particular;

a stator (1) comprising a cylindrical permanent magnet (2) embedded in a cylindrical plastic casing (4) and mounted by appropriate means to a horizontal base (5);

a helical charging coil (3) wound on the opposite ends of said permanent magnet (2) inside said plastic casing (4);

a reciprocator (7) comprising two identical cylindrical electromagnets (8,9) mounted at opposite ends of said permanent magnet (2), axially aligned therewith and spatially separated therefrom; comprising two identical helical charging coils (10,11) wound on said electromagnets (8,9); comprising a helical discharging coil (12) encircling said permanent magnet (2) and occupying the magnetic field thereof; comprising a hollow cylindrical plastic casing (13) enclosing said cylindrical plastic casing (4) and embedding said cylindrical electromagnets (8,9), said helical charging coils (10,11), and said helical discharging coil (12);

a reciprocating pin (15) having an upper end mounted vertically in the bottom of said hollow cylindrical plastic casing (13) at one end thereof;

a reverse-circuit switch (14) mounted on said base (5) below said reciprocaing pin (15); said reverse-circuit switch (14) having a longitudinal groove which is aligned with the longitudinal axis of said reciprocator (7) and which engages a lower end of said reciprocating pin (15);

said stator (1) serving as the stationary member of the electromagnetic reciprocator;

said permanent magnet (2) serving as means of receiving and converting a direct electric current into a polarized magnetic field;

said helical charging coil (3) serving as means of conducting a direct electric current to said permanent magnet (2);

said cylindrical plastic casing (4) serving as embedding means of said permanent magnet (2) and said helical charging coil (3), and serving as mounting means on which said hollow cylindrical plastic casing (13) reciprocates;

said reciprocator (7) serving as the reciprocating member of the electromagnetic reciprocator;

said two electromagnets (8,9) serving as means of receiving and converting a direct electric current into two polarized electromagnetic fields of opposed polarity, and serving as means of simultaneously attracting and repelling opposite ends of said permanent magnet (2) so as to create reciprocating rectilinear movement of said reciprocator (7);

said two helical charging coils (10,11) serving as means of conducting a direct electric current to said two electromagnets (8,9);

said helical discharging coil (12) serving as means of inducing an alternating electric current from the magnetic field of said permanent magnet (2) by reciprocating therethrough;

said hollow cylindrical plastic casing 13 serving as embedding means of said electromagnets (8,9), said helical charging coils (10,11), and said helical discharging coil (12);

said reciprocating pin (15) serving as operating means of said reverse-circuit switch (14); and

said reverse-circuit switch (14) serving as means of reversing the circuit of a direct electric current flowing to said two electromagnets (8,9) when said reciprocating pin (15) reaches an end of said longitudinal groove and reverses the direction of travel of said reciprocating pin (15) in said longitudinal groove.

4,612,468

EXTERNAL ROTOR MOTOR WITH CLAMPED STATOR BUSHING

Gerhard Stürm, Mulfingen; Horst Voss, Künzelsau; Wilhelm Reinhardt, 44, Shrozberg; Martin Wagner; Dieter Best, both of Ingelfingen, and Reinhold Schumann, Niederstetten, all of Fed. Rep. of Germany, assignors to ebm Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,611

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404466

Int. Cl.[4] H02K *5/16*

U.S. Cl. 310—67 R **13 Claims**

1. An external rotor motor especially for driving fans, comprising:

a stationary inside stator including a stator-lamination pack provided with a central bore having a central axis;

an outside rotor arranged to turn about said inside stator, said outside rotor being provided with a rotor bushing on one side of said stator-lamination pack, a shaft being fixedly secured within said rotor bushing, said shaft ex-

tending into said central bore and being rotatably disposed coaxially to said central axis;

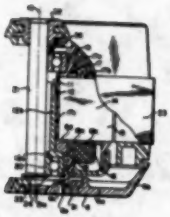
a motor flange for carrying said external rotor motor, said motor flange being disposed on an opposite side of said stator-lamination pack;

said motor flange including a cylindrical added piece extending inwardly toward said stator-lamination pack, said cylindrical added piece surrounding a portion of said shaft and being disposed coaxially to said central axis;

said cylindrical added piece being provided with a first annular crosspiece at an inwardly disposed free end thereof, said first annular crosspiece extending radially toward said shaft to define a first rim portion;

an inwardly facing surface of said first rim portion being disposed against said stator-lamination pack;

a stator bushing having an inwardly disposed portion clampingly seated within said central bore with said shaft extending through said stator bushing, said stator bushing being disposed coaxially to said central axis;



an outward disposed portion of said stator bushing being disposed within said first rim portion, said outward disposed portion being provided with a second annular crosspiece at an outwardly disposed free end of said stator bushing, said second annular crosspiece extending radially away from said shaft toward said cylindrical added piece to define a second rim portion; and

said second rim portion of said stator bushing being seated against an outwardly facing surface of said first rim portion of said cylindrical added piece of said motor flange to sandwich said first rim portion between said second rim portion and said stator-lamination pack for mechanically joining said motor flange to said stator bushing and said stator-lamination pack;

whereby any heat produced by said stator is carried off by said cylindrical added piece to an outside surface of said motor flange and then to surrounding environment.

4,612,469

SPEED GOVERNOR

Kenji Muramatsu, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

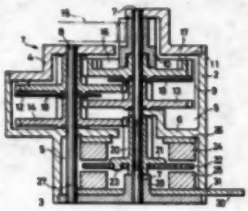
Filed Nov. 9, 1984, Ser. No. 669,925

Claims priority, application Japan, Nov. 10, 1983, 58-174259[U]; Jul. 10, 1984, 59-105067[U]

Int. Cl.[4] H02K 49/02

U.S. Cl. 310—93 16 Claims

1. A speed governor comprising: an input member rotated by an external force; an accelerator wheel train having an input wheel driven by said input member and a final wheel rotated at a higher rotational speed than said input member and a plurality of gears coupling said input member to said final wheel, said plurality of gears being supported on a plurality of parallel shafts; a conductive plate integrated with said final wheel of said wheel train; first and second annular magnets, said magnets being disposed coaxially with one another and with said conductive plate, and said magnets having an air gap between one another, with a portion of said conductive plate being disposed in said air gap; and a casing for supporting the above-mentioned components, said first magnet being fixed to said casing and said second magnet being rotatably supported by said casing, said governor further including an adjusting means for adjusting a rotational position of said second annular mag-



net relative to said first annular magnet, said adjusting means including an adjustment lever projecting outside of said casing.

4,612,470

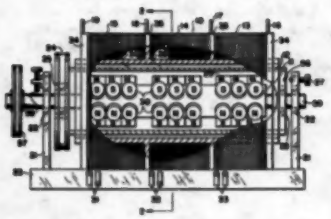
ELECTRIC GENERATOR WITH TWO ROTORS

Berry E. Smith, Jr., Star Rte. 1, Box 392, and Nathan N. Sharron, Star Rte. 1, Box 5220, both of Tallahassee, Fla. 32304

Filed May 7, 1985, Ser. No. 731,476

Int. Cl.[4] H02K 57/00

U.S. Cl. 310—273 21 Claims



1. An electric generator including a stationary field coil, an armature rotatable within the field coil, and a warp sleeve rotatable between said coil and said armature; said coil comprising side-by-side alternating insulated lengths of wire, one insulated length consisting of copper wire and the other insulated length consisting of steel wire; said armature comprising a cylindrical core structure containing on its outside surface a plurality of spaced parallel lengthwise strips of magnetic material having one polarity alternating with a plurality of spaced parallel lengthwise strips of opposite polarity; said warp sleeve comprising a hollow cylinder positioned in close proximity to and spaced apart from the inner surface of said coil and the outer surface of said armature, said sleeve having over its entire length alternating lengthwise strips of material transparent to magnetic flux and material attractive to magnetic flux; and means to rotate one of said armature and said warp sleeve while maintaining the other stationary.

4,612,471

PIEZOELECTRIC VIBRATOR

Takeshi Nakamura, Kyoto; Kenji Ando, Kanagawa, and Ikuo Matsumoto, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 30, 1985, Ser. No. 728,788

Claims priority, application Japan, May 1, 1984, 59-88860

Int. Cl.[4] H01L 41/08

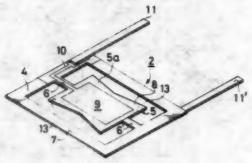
U.S. Cl. 310—321 5 Claims

1. A piezoelectric vibrator adapted to operate in a spreading vibration mode, comprising:

a piezoelectric element;

first and second coupling pieces coupled to respective opposite sides of said piezoelectric element;

a holding frame supporting said piezoelectric element through said coupling pieces; and



compensation means for compensating for a non-vibratory region of said piezoelectric element which is formed between said coupling pieces, said compensation means comprising peripheral parts of said piezoelectric element.

4,612,472

REMOTE CONTROLLED TOY UTILIZING PIEZOELECTRIC ELEMENT

Katsumi Kakizaki, and Yutaka Ajiro, both of Tokyo, Japan, assignors to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,597

Claims priority, application Japan, Oct. 27, 1983, 58-165421[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **8 Claims**

1. A remote control toy which comprises:

a main housing

a remote housing, said remote housing independent of said main housing;

receiver means mounted on said main housing, said receiver means for receiving a transmitted spark radio signal;

motion output means mounted on said main housing, said motion output means for producing a motion in response to receipt by said receiver means of said transmitted spark radio signal;

transmitter means mounted on said remote housing;

said transmitter means including an electrical circuit, said electrical circuit including a transmitting antenna, a piezoelectric element and spark gap means for producing a spark in said electrical circuit in response to an electrical current flow and for providing said spark radio signal responsive to said spark;

said remote housing further including

a moving means capable of being acted on by an operator of said toy and in response to said action said moving means moving against said piezoelectric element so as to cause said piezoelectric element to generate said electrical current flow in said electrical circuit.

4,612,473

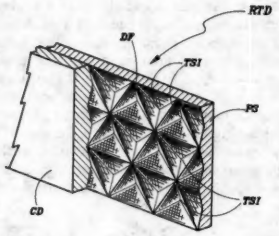
INCANDESCENT LAMP WITH DICHROIC TRIHEDRAL CORNER REFLECTORS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jul. 18, 1984, Ser. No. 632,120

Int. Cl.⁴ H01J *5/16, 61/40*

U.S. Cl. 313—111 **20 Claims**



1. A lamp adapted to be powered from a source of electric power and comprising:

an incandescent filament connected with said source, said filament emitting photons of different frequencies; and

reflect/transmit means composed of numerous trihedral dichroic corner-reflector means and positioned such as to intercept at least a portion of the photons emitted from the filament, said reflect/transmit means having the property of reflecting back onto the filament photons of certain frequencies while permitting photons of other frequencies to pass through with relatively small attenuation.

4,612,474

IN-LINE TYPE ELECTRON GUN

Shigeya Ashizaki, Takatsuki; Masao Natsuhara, Otsu; Koichi Sugahara, Sakai, and Hideo Muranishi, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

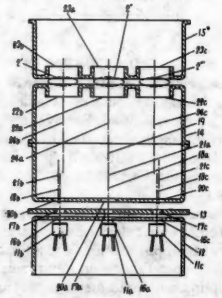
PCT No. PCT/JP83/00308, § 371 Date May 9, 1984, § 102(e) Date May 9, 1984, PCT Pub. No. WO84/01238, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 14, 1983, Ser. No. 610,981

Claims priority, application Japan, Sep. 16, 1982, 57-161613

Int. Cl.⁴ H01J *29/50*

U.S. Cl. 313—414 **8 Claims**



1. In an in-line electron gun for producing a center beam and side beams which is enclosed in a tube having a main tube axis, with said gun including a plurality of cathodes, and serially arranged control, accelerating, focussing and anode electrodes for said cathodes, and with each said electrode having a center beam aperture, whose respective center axes are all aligned with said tube axis, and having side beam apertures whose

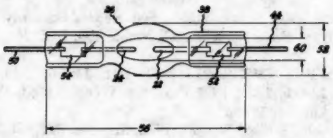
respective center axes are all parallel to said tube axis, the improvement wherein for each side beam: the side beam aperture of said control electrode and of said accelerating electrode have a common center axis which is displaced toward the tube axis from the center axis of the side beam aperture defined in the end surface of said focussing electrode on the side of said accelerating electrode; and the associated side beam apertures respectively defined in the opposed end surfaces of said focussing electrode and said anode electrode have the same diameter, and have a common center axis which is displaced toward the tube axis from said common center axis of the side beam apertures of said control electrode and said accelerating electrode.

4,612,475

INCREASED EFFICACY ARC TUBE FOR A HIGH INTENSITY DISCHARGE LAMP

Robert D. Downing, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,120
Int. Cl.[4] H01J 17/20
U.S. Cl. 313—640 **7 Claims**



1. An arc tube for a high intensity discharge lamp comprising:

an envelope having a bulb portion and first and second elongated stems respectively extending from said bulb portion;

first and second elongated electrodes extending into said envelope and spaced apart in said bulb portion to define an arc discharge path, said first and second electrodes respectively sealed in said first and second stems and regions thereof spaced from said bulb portion, and;

a filling containing an inert gas and a dosage comprising Mercury (Hg), Dysprosium, (Dy), Iodine (I) and Indium (In), wherein the given ingredients of said filling are in the range of:

Hg of about 7 micromoles to about 243 micromoles;

Dy of about 0.1 micromoles to about 2 micromoles;

In of about 0.2 micromoles to about 6.5 micromoles; and

I_2 of about 0.7 micromoles to about 25.0 micromoles.

4,612,476

BROADBAND TRANSVERSE FIELD INTERACTION CONTINUOUS BEAM AMPLIFIER

Louis J. Jasper, Jr., Ocean; Charles M. De Santis, and James F. Baxendale, both of Neptune, all of N.J., assignors to The United States of America as Represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1984, Ser. No. 638,183
Int. Cl.[4] H01J 25/34
U.S. Cl. 315—3.6 **4 Claims**

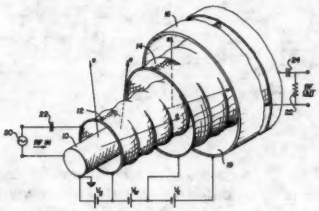
1. A broadband microwave amplification device, comprising:

an elongated coaxial cylindrical cathode structure including a continuous cathode electrode which is operable to emit electrons substantially all along its length;

an elongated coaxial cylindrical electron collector structure including a continuous collector electrode extending in the same longitudinal direction as and located outwardly from said continuous cathode electrode;

slow wave means for modulating said electrons including an elongated coaxial cylindrical continuous modulating grid structure extending in said same longitudinal direction and transversely across the direct path of electrons between said continuous cathode and collector structures;

slow wave means for demodulating the modulated electrons including an elongated coaxial cylindrical continuous demodulating grid structure located between and coextensive with said modulating grid and collector structures in the longitudinal and transverse directions across the direct path of electrons;



input RF signal propagation means including said cathode and said modulating grid structure for propagating an input RF wave longitudinally along the electron path for modulating and thereby prebunching said electrons into beamlets by the process of transverse wave interaction; and

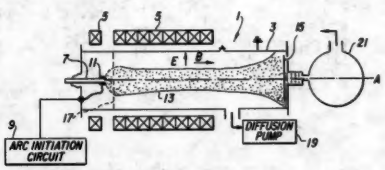
output RF signal propagation means including said collector and said demodulating grid structure for propagating therein an induced RF output wave in the same direction as said input RF wave and resulting from said prebunched electrons traversing said demodulating grid.

4,612,477

TRIGGERING DEVICE FOR A VACUUM ARC IN A PLASMA CENTRIFUGE

Felix Dothan, Jerusalem, Israel, assignor to Yale University, New Haven, Conn.

Filed Dec. 22, 1983, Ser. No. 564,532
Int. Cl.[4] H01J 7/24
U.S. Cl. 315—111.21 **11 Claims**



1. An apparatus for producing a vacuum arc in a plasma centrifuge, said apparatus comprising:

(a) a cathode means comprising a material from which said vacuum arc is formed;

(b) trigger electrode means;

(c) triggering circuit means coupled to said trigger electrode means for storing energy and then applying a break down voltage between said cathode means and said trigger electrode means wherein said cathode means breaks down and initiates said vacuum arc; and

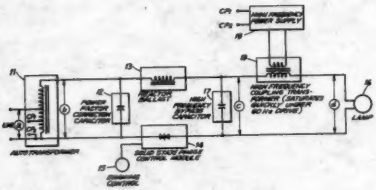
(d) pulse forming means electrically coupled to said cathode means for supplying a constant current pulse to said cathode means to enhance the complete ionization of said vacuum arc, wherein the total ohmic resistance of the pulse forming means is lower than the impedance of the vacuum arc.

4,612,478

DIMMER CIRCUIT FOR HIGH INTENSITY DISCHARGE LAMP

Stephen C. Payne, 2571 Roanoke Ave., New Albany, Ind. 47150

Filed Dec. 19, 1984, Ser. No. 683,762
Int. Cl.[4] H05B 37/00
U.S. Cl. 315—176 1 Claim



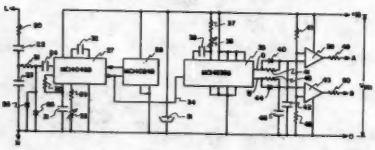
1. In a dimmer circuit for a high intensity discharge lamp, having an autotransformer receptive of line voltage, a power factor correction capacitor disposed across the output of the auto transformer, a reactor ballast in series with the lamp to be dimmed and a solid state phase control circuit connected in series with a lamp to be dimmed, the improvement comprising means for maintaining a lamp arc in the lamp to be dimmed including a high frequency bypass capacitor disposed in parallel with the lamp to be dimmed, a high frequency coupling transformer in series with the lamp to be dimmed and means for applying high frequency power to the input of the high frequency coupling transformer.

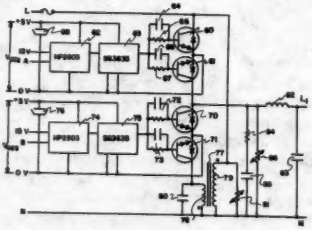
4,612,479

FLUORESCENT LIGHT CONTROLLER

Zoltan Zansky, Willowdale, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1984, Ser. No. 632,787
Int. Cl.[4] G05F 1/00; H05B 37/02, 39/04, 41/36
U.S. Cl. 315—194 7 Claims





1. A dimming system for a fluorescent tube wherein the operation of the fluorescent tube is maintained, said dimming system comprising:

line and neutral source terminals for connection to a source of sinusoidal power;

load terminals for connection to a load having at least one fluorescent tube;

switch means connected to said source terminals and to said load terminals for controlling the supply of power to said load terminals;

switch control means connected to said switch means switching said switch thereby energizing and deenergizing said load terminals to modulate the amount of sinusoidal power input connected between said source and said load on a time ratio variable basis in order to supply a variable amount of power to said load terminals wherein said modulation varies the power input to said load between full power and a finite reduced amount; and

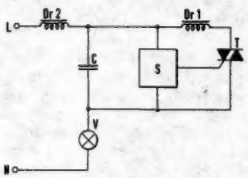
transformer means having a primary winding connected across said source terminals between said source terminals and said switch means and a secondary winding connected between the neutral source terminal and said switch means.

4,612,480

CIRCUIT ARRANGEMENT FOR THE RADIO INTERFERENCE SUPPRESSION IN BRIGHTNESS CONTROL DEVICES USING THE PHASE GATING PRINCIPLE

Dietmar Kneisel, Schalksmühle, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

PCT No. PCT/EP82/00216, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01363, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 27, 1982, Ser. No. 511,167
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139673
Int. Cl.[4] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—224 2 Claims



1. Circuit arrangement using carrier frequency control voltage on low voltage power lines for radio interference suppression in brightness control devices using the phase gating principle, comprising a radio frequency interference filter including an interference suppression choke coil and wherein a semiconductor switch combined with the interference suppression choke coil is connected in series with the load circuit which includes at least one incandescent lamp and wherein a capacitor is shunted in parallel with the series-connection of the interference suppression choke and the semiconductor component, including a further choke in the load circuit which presents a high impedance to the carrier-frequency control voltage, thereby preventing the loading of the control voltage on the power lines caused by the low impedance of said capacitor at the carrier frequency when the semiconductor component is in the non-conducting state.

4,612,481

LINEARITY CORRECTION CIRCUIT

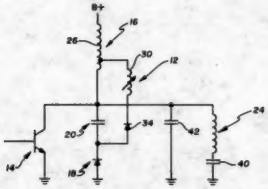
David G. Storberg, Lino Lakes, Minn., assignor to CPT Corporation, Minneapolis, Minn.

Filed Jun. 27, 1984, Ser. No. 625,039
Int. Cl.[4] H01J 29/56
U.S. Cl. 315—370 11 Claims

1. A linearity correction circuit for a high speed horizontal

deflection circuit which causes horizontal traces and retraces to occur on a cathode ray tube, the deflection circuit having a horizontal output transistor, a flyback transformer, said flyback transformer having a primary winding and one or more secondary windings, a damper diode, and a horizontal deflection coil for the cathode ray tube, the linearity correction circuit comprising:

an inductor tapped directly to the primary winding of the flyback transformer;



a linearity correction capacitor connected in series with the damper diode and to the junction of the collector of the horizontal output transistor, the flyback transformer and to the horizontal deflection coil on the cathode ray tube so that the charge on the capacitor provides additional energy to correct linearity of the trace; and

a high speed diode connected in series with the inductor and to the junction of the linearity correction capacitor and the damper diode to charge the capacitor during retrace.

4,612,482

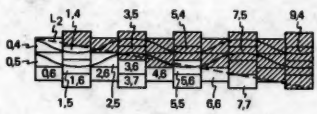
SPATIAL PIXEL OPTIMIZATION TECHNIQUE

William S. Beamon, III, Ormond Beach, and Edward H. Tegge, Jr., Port Orange, both of Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Feb. 1, 1983, Ser. No. 462,767

Int. Cl.⁴ H01J *29/56*; H04N *5/14*

U.S. Cl. 315—371 **9 Claims**



1. A video display system comprising:

a raster scan means for displaying a pattern of picture elements in successive raster lines upon a display screen comprising

(1) a toroidal cathode ray tube main deflection yoke for magnetically deflecting an electron beam directed toward the display screen of the CRT and

(2) micro-deflection means comprising

(i) an auxiliary yoke displaced concentrically with said main deflection yoke and consisting of a toroid of magnetic material disposed concentrically with the main toroidal deflection yoke;

(ii) a pair of micro-deflection windings disposed about said toroid at circumferentially opposite positions and wound about said toroid in opposite directions, such that the magnetic fields produced by current flow through said micro-deflection windings are opposed so as to produce a flux which deflects the electron beam vertically within the neck of the CRT; said micro-deflection windings being series tuned to produce a series resonance at a predetermined frequency,

(iii) distortion correction means comprising a pair of opposed distortion compensation windings disposed about said toroid at circumferentially opposite positions located between said micro-deflection windings and wound about said toroid in opposite directions, such that the magnetic fields produced by current flow through said distortion compensation windings are opposed, and oriented orthogonally to the field of the micro-deflection windings so as to produce a flux which deflects the electron beam horizontally within the neck of the CRT; said distortion compensation windings being series tuned to produce a series resonance at a predetermined frequency, and

(3) means for supplying a sinusoidal deflection signal to said micro-deflection winding pair to superimpose a sinusoidal deflection pattern upon each raster line, said sinusoidal deflection pattern having a frequency of one fourth the pixel rate and a peak-to-peak amplitude equal to the spacing between adjacent lines such that the first pixel of each micro-deflection cycle is located at an undeflected position, a second pixel is located vertically downward offset from the line by one half the line spacing, a third pixel is located at an undeflected position, a fourth pixel is located vertically upward offset from the line by one half the line spacing, and each successive four pixel group duplicates the sinusoidal deflection pattern across the display screen, and

(4) means for supplying a distortion compensation signal to said distortion compensation windings having values for each of a plurality of regions of said screen,

(5) means for synchronizing said sinusoidal micro-deflection signal with the initiation of each raster scan, so that each sinusoidal raster scan line has the same phase at each horizontal position across the screen, and the pixels of consecutive scan lines form vertically aligned columns of pixels, such that the vertically downwardly offset pixels of a first raster scan line and the vertically upwardly offset pixels of an adjacent second raster scan line form a derived raster scan line.

4,612,483

PENETRON COLOR DISPLAY TUBE WITH CHANNEL PLATE ELECTRON MULTIPLIER

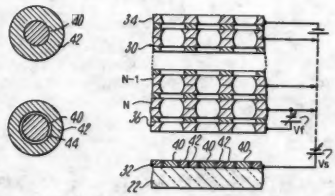
Derek Washington, Wallington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,960

Claims priority, application United Kingdom, Oct. 22, 1982, 8230244

Int. Cl.⁴ H01J *29/80, 29/26, 43/18*; H04N *9/27*

U.S. Cl. 315—376 **12 Claims**



1. A penetron color display tube comprising:

(a) means for producing a low energy electron beam;

(b) a luminescent screen including repetitive groups of phosphor elements for luminescing in different colors;

(c) a channel plate electron multiplier disposed between the beam producing means and the screen, said multiplier including a plurality of channels each having an input end for receiving the low energy electron beam and an output end for emitting a higher energy electron beam toward a respective one of said groups of phosphor elements; and

(d) means for selectively directing the low energy electron beam toward the input ends of the channels in the channel plate electron multiplier;

characterized in that:

(1) each group of phosphor elements includes a first phosphor element comprising a single layer of phosphor material and an adjacent second phosphor element comprising first and second layers of phosphor material, each layer luminescing in a respective color when excited by an electron beam; and

(2) said channel plate electron multiplier includes, at the output end of each channel, electrode means for selectively directing the electron beam emitted thereby toward either said first phosphor element or said second phosphor element in the group toward which the beam is emitted, and accelerating means for selectively accelerating said emitted electron beam to any one of predefined energy levels for effecting excitation of a respective one of the layers in said group.

4,612,484

TELEVISION RECEIVERS

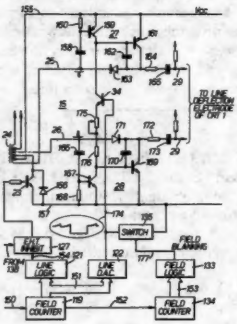
James S. Westwood, and Peter H. Maydew, both of Cambridge, England, assignors to Sinclair Research Limited, Cambridge, England

Filed Sep. 13, 1984, Ser. No. 650,219

Claims priority, application United Kingdom, Sep. 15, 1983, 8324694

Int. Cl.[4] H01J *29/52*

U.S. Cl. 315—384 **11 Claims**



1. A cathode ray tube display apparatus for generating an image by projecting a flying spot on a screen, having line and field scanning circuits in which a coupling is provided from the field scanning circuit to the line scanning circuit to hold the spot off the screen during field flyback.

4,612,485

OVERHEAD DOORS OPERATING APPARATUS

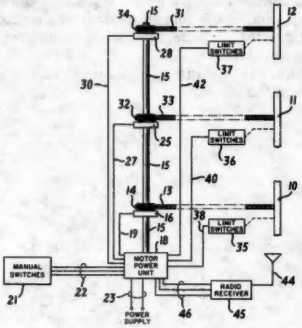
Charles R. Suska, R.R. 1, Box 14, Roxbury, Conn. 06783

Filed Mar. 5, 1985, Ser. No. 708,276

Int. Cl.[4] H02K *7/14*

U.S. Cl. 318—5 **12 Claims**

1. Apparatus for selectively operating a plurality of doors mounted for overhead opening comprising a motor power unit coupled to a mechanical drive means, switching means responsive to actuation for energizing the motor power unit, drive means connected to each door for opening or closing the door, a like plurality of normally inoperative electrically actuated coupling means having input and output members, an output member of each one of the coupling means connected to a corresponding one of the drive means, the mechanical drive means connected to the input members of the electrically actuating coupling means, and said switching means that energizes the motor power unit also electrically actuating one or more of the coupling means to couple together the input and output members and cause the power unit to operate the mechanical drive means for opening and closing one or more of the doors.



4,612,486

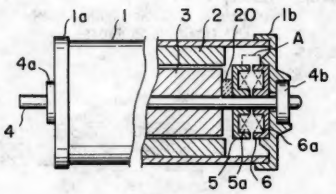
SEMICONDUCTOR ELECTRIC MOTOR HAVING A ROTARY TRANSFORMER TO EXCITE A ROTOR

Itsuki Ban, 3-50-18 Higashi Oizumi, Nerima-ku, Tokyo, and Akihiro Nakajima, 9-8 Ichibayamato-cho, Tsurumi-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed Apr. 19, 1985, Ser. No. 724,881

Int. Cl.[4] H02K *29/12*

U.S. Cl. 318—254 **12 Claims**



1. A semiconductor electric motor comprising:

an outer housing;

a cylindrical magnetic core fixedly mounted to the inside of the outer housing;

polyphase armature coils mounted upon the magnetic core;

a rotative shaft rotatably held by bearings mounted upon said outer housing:

a rotor which is fixed to said rotative shaft and which is excited by exciting coils mounted thereon in such a way that the outer surface is polarized south and north at regular intervals and that the produced magnetic field penetrates through said armature coils;

a first core made from a magnetic material and centrally provided with a hole which is made stationary relative to said rotative shaft extending through the hole;

a second core made from a magnetic material and fixed inside the outer housing;

the first and second cores cooperating with secondary and primary coils respectively mounted upon said first and second cores to constitute a rotary transformer;

an RF oscillator consisting of a semiconductor circuit and acting to supply RF alternating current to said primary coil;

an electric circuit for rectifying the output from said secondary coil and supplying it to said exciting coils; and

an electric current supply control circuit for controlling the

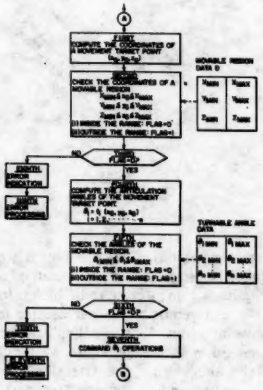
electric current supplied to said armature coils to produce a torque in one direction.

4,612,487

SYSTEM AND METHOD FOR CONTROLLING AN INDUSTRIAL ROBOT

Raiji Shimomura, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,253
Claims priority, application Japan, Aug. 18, 1983, 58-149627
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568 13 Claims



1. A system for controlling an industrial robot of the type having a driving joint for performing rotational motions and operating regions defineable between minimum and maximum angles along distinct axes, comprising:

memory means for storing minimum and maximum values of coordinates along distinct axes in a first coordinate system as first data defining a movable region over which the robot is to be operational, and for storing minimum and maximum values of articulation angles along distinct axes as coordinates in a second coordinate system as second data;

processor means for receiving said first and second data and coordinates in said first coordinate system of a series of target points defining movement of the robot, for generating a first indication if said target points are within said movable region defined by said first data, for, upon generation of said first indication, converting said target points into operating angles along said distinct axes over which driving joints of the robot are to provide rotational motion to drive the objective of the robot between said target points, for generating a second indication if said operating angles exceed said minimum and maximum values of said articulation angles, and for, upon generation of said second indication, transmitting said operating angles and thereby defining third data representing an optional region of the objective of the robot, said optional region being within said movable region and having a shape and size determined by said target points and the movable region; and

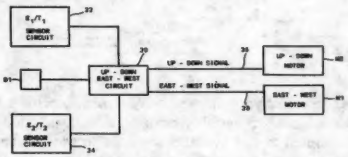
means having storing means for receiving said third data provided from said processor means, for controlling the objective of the robot in response to said data to confine movement of said objective to said optional region during an operational mode of the robot.

4,612,488

APPARATUS FOR CONTROLLING THE DIRECTIONAL ORIENTATION OF A RADIATION RECEIVER DEVICE TO A LIGHT SOURCE

Reinhard Uhlemann, Jülich, and Walter Oster, Kleve-Kellen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 746,961
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422813
Int. Cl.[4] B64C *3/18*
U.S. Cl. 318—582 21 Claims



1. A light sensitive device having a control apparatus for orienting said light sensitive device in relation to a source of light, said light sensitive device having an optical axis, said control apparatus being for directionally controlling said light sensitive device with respect to at least two coordinate axes, said at least two coordinate axes being disposed at an angle with respect to said optical axis, and in operation in relation to said light source, said control apparatus comprising:

a rotatable disc having a first and a second side;

means for rotating said disc about a portion of said disc, said rotating means being operatively connected to said disc;

said portion about which said disc is rotatable being aligned with said optical axis of said device;

means for providing an image of said light source, said image providing means being disposed to provide said image on said first side of said disc, said image providing means for providing in operation said image at a predetermined size on said disc;

said disc being larger than said image provided in operation on said first side by said image providing means;

said disc having a first substantially opaque portion about said portion about which said disc is rotatable;

said disc having a light modifying portion extending at least partially outwardly on said disc from said first opaque portion;

a second substantially opaque portion of said disc also at least partially extending outwardly from said first opaque portion of said disc;

light sensitive means for generating an electrical signal when impinged upon by light;

means for dividing said signal from said light sensitive means, when said disc is rotating, into coordinate displacement signals relating to displacement of said image from said optical axis with respect to said at least two coordinate axes;

said light sensitive means being disposed to generate said signal from light related to light acting upon said light modifying portion of said disc;

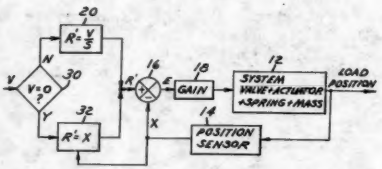
motive means for orienting said light sensitive device and said optical axis with respect to said at least two coordinate axes; and

said signal dividing means being connected to said motive means to drive said device to dispose said image from said image providing means, in operation, onto said first opaque portion of said disc and substantially to orient said image about a predetermined portion of said first opaque portion of said disc including said portion about which said disc is rotatable.

4,612,489
POWER TRANSMISSION

Rajamouli Gunda, Rochester, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Dec. 20, 1984, Ser. No. 684,265
Int. Cl.[4] G05B 5/01
U.S. Cl. 318—590 2 Claims

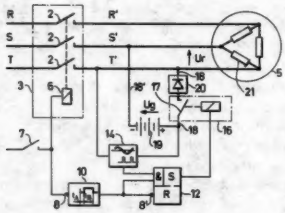


1. An electrohydraulic servo system comprising a valve actuator adapted to variably position a load, position sensing means coupled to said actuator and load to provide an electrical signal indicative of actual position at said actuator and load, means for receiving a motion command signal, motion command integration means responsive to said motion command signal to provide a position command signal, means for providing an error signal to control said valve actuator as a function of a difference between said actual position signal and said position command signal, and means responsive to said motion command signal independently of said integration means for automatically setting said position command signal equal to said actual position signal when said motion command signal is equal to zero.

4,612,490
METHOD AND SYSTEM OF BRAKING AND ASYNCHRONOUS MOTOR

Ulrich Kagi, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 21, 1985, Ser. No. 703,721
Claims priority, application Switzerland, Feb. 24, 1984, 920/84
Int. Cl.[4] H02P 3/24
U.S. Cl. 318—761 17 Claims



1. A method of braking an asynchronous motor having a plurality of windings connected to a three-phase network voltage, said method comprising the steps of

injecting a braking direct current voltage through a unidirectional path into at least one of the motor windings at a make time;

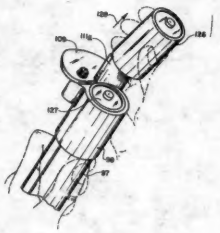
selecting the make time between a first reference time whereat the braking direct current voltage is closest to a back-voltage of said one motor winding at said first reference time and a second reference time leading a first peak in time of the back voltage to occur after said first reference time by an amount equal to 5% of the full periodicity of the network voltage; and

wherein the braking direct current voltage at the make time has a polarity opposite to the polarity towards which the back-voltage tends at said first reference time.

4,612,491
CHARGER FOR BATTERIES

George W. McCarty, Lutherville, and Somers H. Smith, III, Columbia, both of Md., assignors to Solid State Chargers Research & Development Limited Partnership, Lutherville, Md.

Continuation-in-part of Ser. No. 598,580, Apr. 10, 1984, Pat. No. 4,527,110. This application Jul. 1, 1985, Ser. No. 750,473
Int. Cl.[4] H02J 7/00; H01M 10/46
U.S. Cl. 320—2 11 Claims

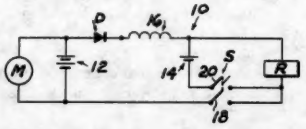


1. In a charger for batteries, the combination of a charging station including a housing having a longitudinal recess formed therein, a casing having an interior and which is to hold at least one battery to be charged or recharged adapted to be received within the recess, an upwardly projecting boss on the housing of the charging station above the recess, a laterally-projecting guide carried by the casing, the laterally-projecting guide having an open bottom end and being adapted to be supported on the upwardly-projecting boss on the housing of the charging station, thereby removably supporting the casing on the housing of the charging station, a lid pivotably mounted on the casing, wherein the lid can be pivoted to allow individual batteries to be inserted into or removed from the casing, means including an element on the housing of the charging station and cooperating with the pivotally mounted lid on the casing to prevent the lid from being pivoted sufficiently whenever the casing is received and supported within the recess thereby precluding access to the interior of the casing when the casing is mounted and supported on the housing of the charging station within the recess, and electrical connection means between the housing of the charging station and the interior of the casing and including electrcial contacts within the respective boss and guide.

4,612,492
CONSTANT VOLTAGE POWER CIRCUIT FOR A REMOTELY CONTROLLED DEVICE

Leslie L. Burk, 8413 NW. 92, Oklahoma City, Okla. 73132

Filed Dec. 24, 1984, Ser. No. 686,326
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—3 5 Claims



1. A circuit providing a constant voltage power source for a remotely controlled electrically operated device, comprising:

a main battery;

a primary motor operatively connected with said main battery;

a secondary battery connected in parallel with said main battery,

said secondary battery being a sealed at least partially rechargeable battery having a current capability substantially smaller than the main battery;

a wireless receiver connected with the positive terminals of said batteries;

a double-pole single-throw switch having its respective poles interposed between the respective negative terminals of said batteries and said receiver for simultaneously energizing the receiver and applying charging potential, when closed, from the main battery to the secondary battery; and,

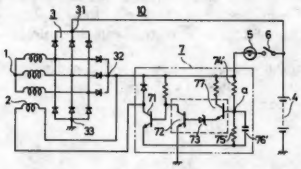
discharge preventing means interposed between the positive terminals of said batteries for preventing discharge of said secondary battery to said main battery.

4,612,493

CONTROL DEVICE FOR CHARGING GENERATOR

Tadashi Katashima, and Yoshiyuki Iwaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushik Kaisha, Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,288
Claims priority, application Japan, Jun. 20, 1983, 58-96423[U]
Int. Cl.⁴ H02J *7/00*
U.S. Cl. 320—64 **3 Claims**



1. A control device for a charging generator, comprising:

means for rectifying an alternating current output produced at output terminals of stator coils of said charging generator to produce a first DC output for charging a storage battery and a second DC output for driving a field coil of said generator;

a switching transistor for controlling an amount of current passing through said field coil;

a control transistor for controlling said switching transistor;

first and second resistors forming a voltage divider for voltage dividing said second DC output produced by said rectifying means;

a capacitor connected between a junction point of said first and second resistors and a ground terminal of said rectifying means;

a detection and amplification transistor having a base connected to said junction point of said first and second resistors; and

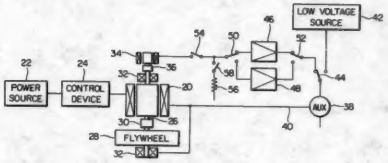
a Zener diode connected between an emitter of said detection and amplification transistor and a base of said control transistor, said Zener diode becoming conductive when said second DC output voltage is higher than a predetermined value, said control device being formed in a hybrid integrated circuit, said detection and amplification transistor being positioned within said control device such that a value of said capacitor may be lowered sufficiently to enable formation in said hybrid integrated circuit.

4,612,494

FLYWHEEL ENERGY STORAGE SYSTEM

Toshimi Kawamura, Suita, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,935
Claims priority, application Japan, Jan. 18, 1984, 59-5788
Int. Cl.⁴ H02K *7/02*
U.S. Cl. 322—4 **5 Claims**



1. A flywheel energy storage system comprising:

a dynamoelectric machine;

a flywheel connected to said dynamoelectric machine for rotation therewith

an auxiliary machine for performing operational tasks associated with the operation of said dynamoelectric machine and said flywheel;

a low voltage power source for operating said auxiliary machine;

a permanent magnet generator connected to be operated by energy stored in said flywheel for generating electric power of a varying voltage when said low-voltage power source is not available; and

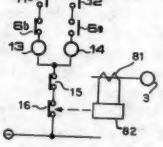
converter means connected between said permanent magnet generator and said auxiliary machine for converting said varying voltage from said permanent magnet generator into a stable voltage to provide a power supply for said auxiliary machine.

4,612,495

GENERATOR CIRCUITRY

Takao Yamauchi; Hayato Suzuki; Osamu Iwabuchi, and Toshinobu Kishimoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,604
Claims priority, application Japan, Mar. 4, 1983, 58-31756[U]; Mar. 4, 1983, 58-31757[U]; Mar. 4, 1983, 58-31758[U]
Int. Cl.⁴ H02J *1/00, 3/00*; H03H *1/00, 3/00*
U.S. Cl. 322—100 **13 Claims**

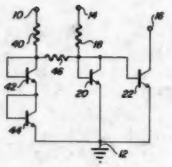


1. In a generator circuitry having a first disconnector, a breaker and a second disconnector connected in series with one another between a generator and a bus connected to a power supply, the improvement comprising: an operating circuit for opening or closing said first and second disconnectors; means for detecting the output of said generator; and means for prohibiting an action of opening said first and second disconnectors during detection of the generator output by said detecting means.

4,612,496
LINEAR VOLTAGE-TO-CURRENT CONVERTER

John R. Hines, Garland, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 656,204
Int. Cl.[4] G05F 3/26
U.S. Cl. 323—315 18 Claims



1. A method of converting an input voltage into an output current which is linearly related to the input voltage, the method comprising the steps of:

sensing a current produced by the input voltage applied to a resistor having a predetermined resistance and being coupled to a node which remains at a substantially constant voltage approximately one diode-drop from a common potential;

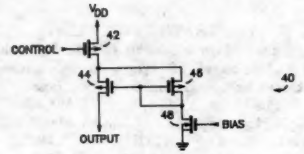
mirroring the sensed current from said sensing step at an output node; and

increasing the current at the output node of said mirroring step by an amount substantially equivalent to the voltage of one diode-drop divided by the predetermined resistance of the resistor.

4,612,497
MOS CURRENT LIMITING OUTPUT CIRCUIT

Richard W. Ulmer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 13, 1985, Ser. No. 776,188
Int. Cl.[4] H03K 5/08
U.S. Cl. 323—315 7 Claims



1. In a circuit having an output driver transistor for selectively providing an output voltage to an output terminal, an output current limit circuit for limiting the output current at the output terminal to a predetermined maximum value, comprising:

current sink means coupled to a reference voltage terminal, for receiving a sink current; and

current mirror means having a diode configured transistor having the current conducting electrodes thereof coupled between the driver transistor and the current sink means, for providing the sink current, and a mirror transistor having the current electrodes thereof coupled between the driver transistor and the output terminal, for limiting said output current.

4,612,498
INDUCTION FURNACE FAULT LOCATOR

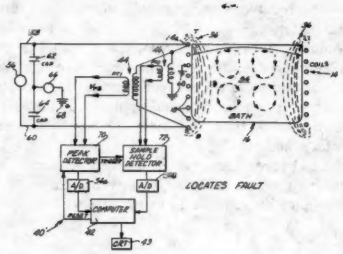
Daniel S. Smalley, 15640 Colfax Cove, Big Rapids, Mich. 49307

Division of Ser. No. 405,754, Aug. 6, 1982, Pat. No. 4,525,665. This application Apr. 12, 1985, Ser. No. 722,523
Int. Cl.[4] G01R 31/08; G06F 15/20
U.S. Cl. 324—52 10 Claims

1. A method of locating a ground fault between first and second positions on an alternating current coil comprising the steps of:

determining a first voltage potential between the first position and an electrical ground;

determining a second voltage potential between the first position and the second position;



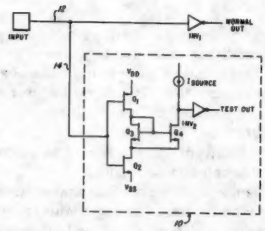
calculating the ratio of said first voltage potential to said second voltage potential to provide an indication of the relative position of the ground fault on the coil; and

adjusting said ratio by a value contained in a predetermined look-up table to compensate for variations in impedance throughout the length of the coil to improve the accuracy of the indications.

4,612,499
TEST INPUT DEMULTIPLEXING CIRCUIT

Bernhard H. Andresen, and Stanley C. Keeney, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 7, 1983, Ser. No. 549,121
Int. Cl.[4] G01R 31/28
U.S. Cl. 324—73 R 6 Claims



1. A circuit for demultiplexing at least two information signals, comprising:

an input line;

two complementary field effect devices having gates coupled to said input line, wherein each of said field effect devices has a threshold voltage less than one-half of an available power supply voltage, and wherein said field effect devices are coupled together in series to create a current path across the power supply only when both of said field effect devices are on;

means coupled to said field effect devices for sensing the passage of current through the current path; and

a switch coupled to said sensing means, wherein said switch has a first state when said sensing means detects current flow and a second state when no current flow is detected.

4,612,500

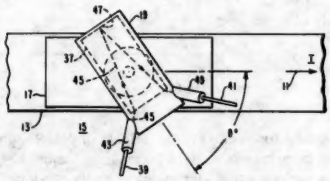
TEMPERATURE STABILIZED FARADAY ROTATOR CURRENT SENSOR BY THERMAL MECHANICAL MEANS

Cheng-lin Chen, Penn Hills; Juris A. Asars, Murrysville, both of Pa., and Eugene G. Vaerewyck, Albuquerque, N. Mex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 647,201

Int. Cl.[4] G01R *15/07*; G02F *1/09*

U.S. Cl. 324—96 **6 Claims**



1. A device for measuring the current flowing through an electric conductor, comprising:

(a) a body of magnetic-optical material disposed within the magnetic field lines of a current-carrying conductor;

(b) thermal-mechanical rotator means on the body for rotating the body within the magnetic field lines in response to variations in temperature;

(c) polarizing means for directing a beam of polarized light having a predetermined plane of polarization into the body to produce a reflected polarized light beam having a rotated plane of polarization; and

(d) analyzer means for detecting the rotated plane of polarization and generating an output signal in response thereto; and

(e) electronic circuit means responsive to the output signal of the analyzer means for producing an electronic signal proportional to the current and temperature in the conductor.

4,612,501

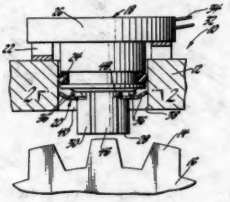
SELF-ADJUSTING MAGNETIC SENSOR

Scott M. Costello, Dearborn, and William J. Vukovich, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 26, 1984, Ser. No. 634,600

Int. Cl.[4] G01B *7/14*; G01P *3/42, 1/00*; F16B *21/18*

U.S. Cl. 324—208 **2 Claims**



1. A self-adjusting sensing mechanism for use in a relatively stationary housing having an aperture and being held in close proximity to a device to be sensed, disposed in the housing, said mechanism comprising; a retainer ring of predetermined thickness having a central aperture with radially inwardly extending tab means and a plurality of tine means on the outer periphery thereof for engaging the aperture surface during assembly of said mechanism; sensor means having a cylindrical axial extension with axially extending slot means thereon alignable with said tab means for permitting insertion of said sensor means into said retainer ring, and circumferentially extending slot means of a predetermined width which is greater than the thickness of said retainer ring and being alignable with said tab means for permitting rotation of said sensor means relative to said retainer ring to limit the axial movement of the sensor means relative to the retainer ring to an amount equal to the difference between the predetermined width and said predetermined thickness, said sensor means and said retainer ring being inserted in said aperture simultaneously until said sensor means contacts said device; and resilient means for urging said sensor means toward removal from the retainer ring, said circumferential slot means and said tab means preventing removal when said sensor is rotated to misalign said tab means and said axial slot means, said sensor being spaced from said device by said resilient means the amount equal to the difference between said predetermined thickness and said predetermined width.

4,612,502

MAGNETIC LENGTH OR ANGLE MEASURING SYSTEM HAVING IMPROVED MAGNETIC SENSOR ARRANGEMENT

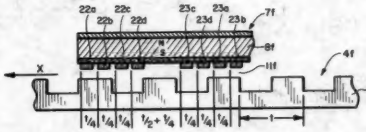
Alfons Spies, Seebruck, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,849

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214794

Int. Cl.[4] G01B *7/14*

U.S. Cl. 324—208 **18 Claims**



1. In a magnetic measuring system for measuring the relative position of a first object with respect to a second object in a measuring direction, said system comprising means for defining a measuring division of alternating magnetically conducting and magnetically non-conducting zones, a scanning unit mounted to scan the division, and means for evaluating measuring signals to determine the position of the scanning unit with respect to the measuring division, the improvement comprising:

at least one magnet mounted to the scanning unit and oriented such that induction generated by the magnet in the measuring division extends only in planes perpendicular to the measuring direction and an air gap is created between the magnet and the measuring division;

at least one magnetic field sensitive element firmly secured adjacent the magnet to scan the measuring division, each of which elements generates a position dependent output signal as a function of measured magnetic induction in the air gap; and

means for supplying the output signals to the evaluating means;

wherein the measuring division defines a division period t;

wherein the at least one magnetic field sensitive element comprises first, second and third magnetic field sensitive elements;

wherein the length of the first and third elements in the measuring direction is less than t/2;

wherein the separation between the first and third elements is equal to $(n+\frac{1}{4})\cdot t$ $(n=1, 2, 3, \ldots)$;

wherein the length of the second element in the measuring direction is equal to $n\cdot t$ $(n=1, 2, 3 \ldots)$;

wherein the supplying means operates to supply a first measuring signal, proportional to the difference between the

signal of the first element and half the signal of the second element, and a second measuring signal, proportional to the difference between the signal of the third element and half the signal of the second element, to the evaluating means.

4,612,503

ROTATION SPEED DETECTION DEVICE HAVING A ROTATION ANGLE DETECTOR OF INDUCTIVE TYPE

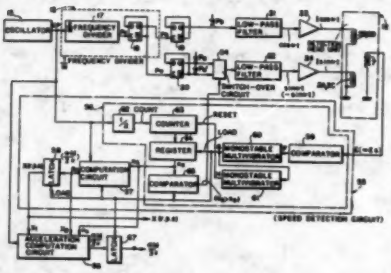
Wataru Shimizu, Fuchu, and Akira Yamashita, Komae, both of Japan, assignors to Kabushiki Kaisha S G, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,277

Claims priority, application Japan, Oct. 21, 1980, 55-147425; Nov. 25, 1980, 55-164665

Int. Cl.⁴ G01B 7/14; G01P 3/42; G08C 19/16

U.S. Cl. 324—208 5 Claims



1. A rotation speed detection device comprising:

stator means having a plurality of poles which include end portions, said poles being arranged in a predetermined arrangement, said stator means further having primary coils being wound on the respective poles and secondary coils being wound on the respective poles in association with the respective primary coils;

rotor means of such configuration as to oppose the end portions of the respective poles with gaps therebetween, change reluctance of magnetic paths passing the respective poles in accordance with a rotational angle and receive a rotational movement or displacement by rotation, which is an object of detection from outside;

a first circuit for exciting each of said primary coils with one of a plurality of reference AC signals, each pole excitation signal being out of phase with the excitation signals of adjacent poles by a predetermined electrical angle;

a second circuit for summing outputs of the respective secondary coils and thereby generating an output signal resulting by phase modulating the reference AC signals in accordance with the rotation speed of said rotor means;

a third circuit for detecting the rotation speed of said rotor means in accordance with the difference in frequency or period between the reference AC signals and the output signal from the second circuit;

a memory circuit for temporarily storing the rotation speed data having been detected by said third circuit, and a fourth circuit for detecting rotation acceleration of said rotor means in accordance with the difference between the rotation speed data temporarily held in said memory circuit and rotation speed data which has been newly detected by said third circuit.

4,612,504

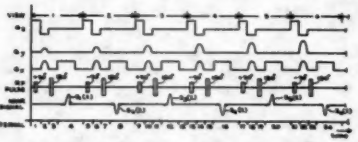
METHOD FOR REMOVING THE EFFECTS OF BASELINE ERROR COMPONENTS IN NMR IMAGING APPLICATIONS

Norbert J. Pelc, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 21, 1984, Ser. No. 673,691

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309 25 Claims



1. A method for removing the effects of NMR signal baseline error components in NMR imaging techniques, which techniques include a predetermined plurality of views, each of which includes the application of an RF excitation pulse and a phase-encoding magnetic field gradient pulse along at least one dimensional axis of a study object, wherein said gradient pulse is selected to have a different amplitude in each view, said method comprising:

alternating the phase of the RF excitation pulse by 180° in views acquired with adjacent values of gradient amplitudes in at least one direction;

observing the NMR signals resulting from the application of said phase-alternated RF pulses; and

constructing an image of the study object.

4,612,505

NUCLEAR MAGNETIC RESONANCE APPARATUS

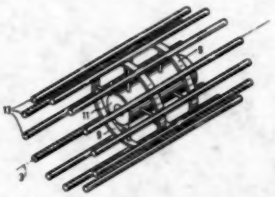
Hinne Zijlstra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,800

Claims priority, application Netherlands, Oct. 14, 1983, 8303535

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318 9 Claims

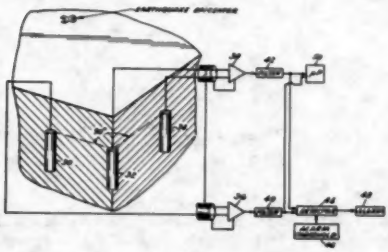


1. A nuclear magnetic resonance apparatus, comprising a magnet which comprises an electromagnetic coil system for generating a homogeneous magnetic field in an examination space which is enclosed by the magnet, and a shield for the external stray field of the coil system arranged coaxially about the electromagnetic coil system, the shield comprising a plurality of rods of a soft magnetic material which are axially directed and uniformly spaced on at least a portion of a cylindrical surface which extends concentrically about the coil system, the length of said rods being at least equal to the axial length of the coil system.

4,612,506
METHOD OF FORECASTING SEISMIC ACTIVITY RESPONSIVE TO EARTH CURRENTS

Panayiotis A. Varotsos, Knossos str. 36, Glyfada, Attica; Kessar D. Alexopoulos, Spefsipou str. 7, Athens 139, and Konstantine D. Nomicos, Charilaou Trikoupi 154, Athens 709, all of Greece

Filed Jan. 18, 1982, Ser. No. 340,219
Int. Cl.[4] G01V 3/08
U.S. Cl. 324—348 10 Claims

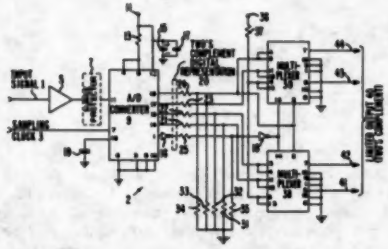


1. A method of forecasting earthquakes as a function of variations in telluric electrical earth current comprising the steps of positioning a pair of electrodes beneath the earth surface at each of a plurality of spaced locations, measuring a voltage developed between said electrodes at each said location as a function of telluric earth currents passing therebetween, identifying a transient change in said voltage of preselected amplitude and frequency characteristics at each said location, and following termination of said transient change of preselected amplitude and frequency characteristics forecasting time of occurrence, magnitude and epicenter of an earthquake as a function of said amplitude and frequency characteristics at each said location and comparison of said characteristics at said plurality of locations to each other, said transient change having a time duration which is less than the time between termination of said transient change and the forecast time of occurrence of said earthquake.

4,612,507
DIGITAL LIMITER

Jacob H. Wisniewski, Palo Alto, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Aug. 27, 1984, Ser. No. 644,850
Int. Cl.[4] H03K 5/08; H03G 11/00
U.S. Cl. 328—169 5 Claims



1. A digital limiter for limiting the amplitude of an analog input signal to within a preselected useful range having preselected upper and lower boundary values, said limiter comprising:

coupled to the input signal, means for converting the amplitude of the input signal into a digital representation;

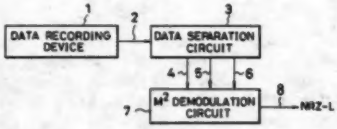
coupled to an output of the converting means, means for determining whether the digital representation is within the useful range, above the useful range, or below the useful range; and

coupled to an output of the determining means, means for limiting the value of a digital representation that is above the useful range to the upper boundary value, wherein said limiting means limits the value of a digital representation that is below the useful range to the lower boundary value, and said limiting means passes through unscathed those digital representations that are within the useful range.

4,612,508
MODIFIED MILLER DATA DEMODULATOR

Takao Rokutan, Hachioji, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,507
Claims priority, application Japan, Sep. 29, 1984, 59-202981
Int. Cl.[4] H03M 7/00
U.S. Cl. 329—50 2 Claims



1. A data demodulator comprising:

a data recording device in which is recorded digital data which has been subjected to M^2 modulation;

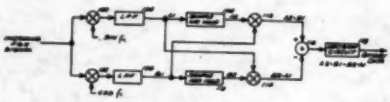
a data separation circuit for producing synchronizing clock pulses from said data which has been subjected to M^2 modulation and been reproduced by said recording device, and for separating said data into clock bits and data bits; and

an M^2 modulation data demodulation circuit for producing NRZ - L data by using said clock bits, data bits and synchronizing clock pulses which are output from said data separation circuit.

4,612,509
FREQUENCY SHIFT KEYED DEMODULATOR

William L. Betts, St. Petersburg; Wesley H. Smith, and Michael R. Deakley, both of Largo, all of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Jan. 13, 1983, Ser. No. 457,521
Int. Cl.[4] H04L 27/14
U.S. Cl. 329—50 7 Claims



6. A method of demodulating a frequency-shifted input signal varied between two frequencies f_1 and f_2, comprising the steps of:

multiplying said input signal with a first signal having a predetermined frequency fc between said frequencies f_1 and f_2 to obtain a first component;

multiplying said input signal with a second signal in quadrature with said first signal to obtain a second component;

delaying said first and second components to obtain first and second delayed components;

multiplying said first component with said second delayed component and said second component with said first delayed component to obtain first and second products respectively; and

summing said first and second products.

4,612,510

FM DEMODULATOR USING COMBINED OUTPUTS OF PLURAL FM DETECTORS

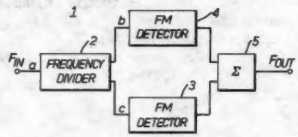
Rodney J. Lawton, Swindon, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Dec. 10, 1984, Ser. No. 679,943

Claims priority, application United Kingdom, Dec. 9, 1983, 8332897; Jun. 1, 1984, 8414056

Int. Cl.⁴ H03D *3/00*; H03K *9/06*

U.S. Cl. 329—107 **9 Claims**



1. An FM detection apparatus comprising a frequency dividing means, having a division ratio N, arranged to receive an incoming radio frequency (RF) signal carrying frequency modulation and to frequency divide the RF signal to provide a plurality of frequency divided signals each at the same frequency but mutually phase displaced so that the RF signal is represented by the divided signals in combination, a plurality of quadrature type FM detectors arranged so that each quadrature type FM detector receives a different one of the frequency divided signals and provides an output signal corresponding to the frequency modulation carried by the received frequency divided signal, and adding means operative to combine the output signals to provide a demodulated signal corresponding to the modulation carried by the incoming RF signal.

4,612,511

FM DEMODULATOR INCLUDING PLL AND IMPROVED CIRCUITRY FOR ELIMINATING DISTORTION IN THE OUTPUT THEREOF

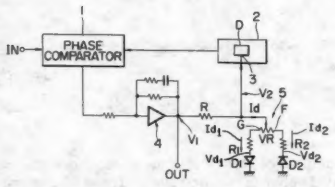
Michinori Naito, and Shigeru Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,027

Claims priority, application Japan, Oct. 26, 1982, 57-161139[U]

Int. Cl.⁴ H03D *3/00*

U.S. Cl. 329—124 **10 Claims**



1. An FM demodulator having a phase comparator, a low-pass filter and a non-linear VCO including a variable capacitance diode, an input signal being applied to said phase comparator and a demodulated output signal being taken from said low-pass filter, said FM demodulator further including a non-linear element responsive to said demodulated output signal for removing therefrom any second harmonic components which may be present therein due to said variable capacitance diode.

4,612,512

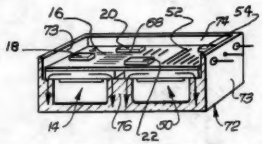
AMPLIFIER CIRCUIT PACKAGING CONSTRUCTION

Jack Powell, Hermosa Beach, and Charles E. Liatsos, Pacific Palisades, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 15, 1984, Ser. No. 621,333

Int. Cl.⁴ H03F *3/60*

U.S. Cl. 330—66 **9 Claims**



1. A packaging construction for a radio-frequency (rf) circuit having active and passive components, the construction comprising:

a circuit board having passive components and circuit connections formed on one face and having its other face metallized;

active components formed on metal heat sinks, which are bonded to the metallized face of the circuit board to form a single ground plane; and

a housing having integral means for closely contacting the heat sinks of the active components, to provide heat flow paths into the housing;

whereby the single ground plane provides extremely good grounding for the active and passive components of the circuit, and whereby heat generated by the active components is efficiently dissipated through the heat sinks to the housing, and the components are well isolated from each other and from the environment.

4,612,513

DIFFERENTIAL AMPLIFIER

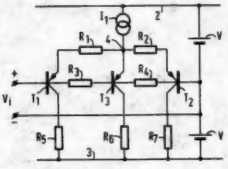
Evert Seevinck, Enschede, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,288

Claims priority, application Netherlands, Mar. 13, 1984, 8400790

Int. Cl.⁴ H03F *3/45*

U.S. Cl. 330—261 **1 Claim**



1. A differential amplifier comprising a pair of input terminals and a first transistor (T1) and a second transistor (T2) of the same conductivity type, whose emitters are each connected to a common point by respective first resistors (R1, R2), which first resistors are substantially equal to each other, the bases of the first and second transistors being connected to said input terminals; a third transistor (T3) which is of the same conductivity type as the first and the second transistors and whose emitter is coupled to the common point; a current source (I1) for supplying the quiescent current of the amplifier, which

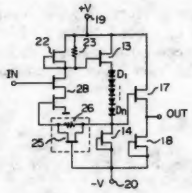
source is connected to the common point; and a voltage divider arranged between the bases of the first and the second transistors, which voltage divider comprises two substantially identical second resistors (R3, R4), the base of the third transistor being connected to the junction point of said second resistors.

4,612,514

FEEDBACK AMPLIFIER

Masafumi Shigaki, Kawasaki, and Yukio Takeda, Zama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 26, 1984, Ser. No. 593,428
Claims priority, application Japan, Apr. 8, 1983, 58-61761
Int. Cl.⁴ H03F 3/16; H03G 3/30
U.S. Cl. 330—277 **5 Claims**



1. A feedback amplifier operatively connectable to an electric source and operatively connectable to receive a control voltage, comprising:

an inversion circuit, having an input terminal and an output terminal, comprising:

an input active element including a dual gate transistor having a first gate operatively connected to the input terminal of said inversion circuit; and

a load element operatively connected in cascade with said input active element and the electric source;

a constant current active load operatively connected to the electric source;

a level shift circuit having an output terminal and comprising:

a first field effect transistor having a gate operatively connected to the output terminal of said inversion circuit; and

at least one diode operatively connected between said field effect transistor and said constant current active load;

a feedback resistive element operatively connected between the output terminal of said level shift circuit and the input terminal of said inversion circuit, and operatively connected to a second gate of said dual gate transistor of said active input element, said feedback resistive element including a second field effect transistor having a gate terminal for receiving the control voltage so as to vary the value of the feedback resistance and a first resistor operatively connected in parallel with said second field effect transistor.

4,612,515

PLL HAVING PHASE COMPARATOR WITH HYSTERESIS CHARACTERISTICS

Michihisa Ohkawa, and Hideo Kobayashi, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

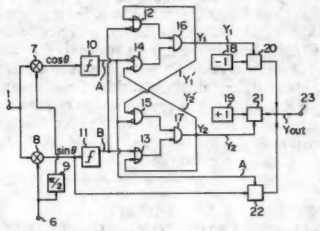
Filed Jun. 28, 1985, Ser. No. 749,848
Claims priority, application Japan, Jul. 4, 1984, 59-137269
Int. Cl.⁴ H03L 7/06
U.S. Cl. 331—1 A **4 Claims**

1. A phase synchronization circuit comprising:

a phase comparator which receives an input signal;

a loop filter coupled with an output of said phase comparator;

a voltage controlled oscillator coupled with an output of said loop filter to provide an output frequency signal to said phase comparator and a phase locked output signal; and



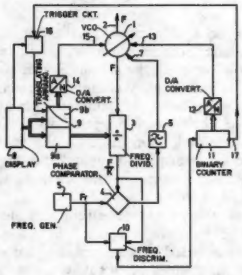
wherein said phase comparator has hysterisis characteristics in which one of a pair of output levels are provided for each input phase difference depending on phase error direction immediately before entering the hysteresis region, except in the vicinity of stable points of phase.

4,612,516

RAPIDLY TUNABLE FREQUENCY SYNTHESIZER WITH OSCILLATOR FREQUENCY PRESETTING MEANS

Jean-Pierre Defeuilley, Cressely, and Jean Nguyen-van-Nguyen, Gif sur Yvette, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 434,441, Oct. 14, 1982, abandoned. This application Aug. 13, 1985, Ser. No. 765,565
Claims priority, application France, Oct. 16, 1981, 81 19486
Int. Cl.⁴ H03L 7/00
U.S. Cl. 331—11 **8 Claims**



1. In a frequency synthesizer comprising a voltage-controlled oscillator, a variable divider for dividing the output frequency of said oscillator, a display unit for displaying a desired frequency from which there is derived a digital control data representing the dividing ratio of said variable divider, a phrase comparator which receives the divided oscillator frequency and a reference frequency and supplies a frequency control voltage for said oscillator, and a search tuning loop comprising a frequency discriminator which receives the divided oscillator frequency and the reference frequency and which supplies pulses when these frequencies are different, a counter for counting these pulses, said counter being automatically reset to an initial position thereof when said counter reaches an end position thereof, and converting means for converting the digital data representing the count of said counter into a search tuning voltage for controlling the fre-

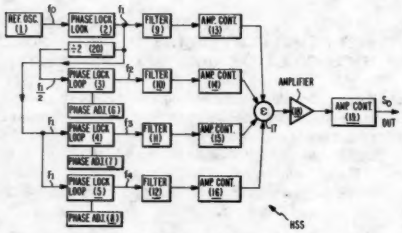
quency of said oscillator, whereby the search tuning voltage repetitively scans a given voltage range in response to said pulses; the improvement wherein said frequency synthesizer further comprises means for translating the displayed frequency into digital presetting data whose values represent frequency sub-ranges to which the displayed frequency may belong, said converting means comprising means for converting the digital presetting data into a presetting voltage for controlling the frequency of said oscillator, the values of the presetting voltage being selected to produce substantially the starting frequencies of the sub-ranges while the variation of the search tuning voltage is selected to produce a frequency variation substantially equal to the width of a sub-range, said converting means further comprising means responsive to a determined change in said scanning voltage for changing the subrange within which the frequency of said oscillator is scanned by said search tuning voltage.

4,612,517

SIGNAL SIMULATOR FOR MAGNETIC RECORDING HEAD

Ronald H. Wagner, Fremont, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed May 23, 1984, Ser. No. 612,970
Int. Cl.⁴ H03B *25/00*
U.S. Cl. 331—46 **60 Claims**



BLOCK DIAGRAM, HEAD SIGNAL SIMULATOR

1. A head signal simulator for generating simulated signals S_o from a magnetic recording head without use of the head or associated media, wherein the signals S_o can be readily varied in amplitude and frequency-content to synthesize various head-readback waveforms, this simulator comprising:

reference oscillator means inputted to a plurality of prescribed phase-lock loop circuits, one such circuit for a prescribed waveform fundamental and one or more other phase-lock loop circuits, each such circuit corresponding to a different harmonic;

summing means inputted from all the said phase-locked loop circuits; and

output means inputted by said summing means and adapted to present the desired output waveform S_o.

4,612,518

QPSK MODULATOR OR DEMODULATOR USING SUBHARMONIC PUMP CARRIER SIGNALS

Michael J. Gans, Monmouth Beach; Martin V. Schneider, Holmdel, and Ralph F. Trambarulo, Red Bank, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 28, 1985, Ser. No. 738,441
Int. Cl.⁴ H04L *27/20, 27/22*
U.S. Cl. 332—21 **20 Claims**

1. A Quadrature Phase Shift Keying (QPSK) modulator comprising:

a first and a second input terminal for receiving a first and a second digital signal, respectively, for propagation along a respective first and second rail;

means for coupling an in-phase and a 90°/n subharmonic pump carrier signal into the first and second rail, respectively, the pump carrier signal comprising a frequency which is a submultiple (1/n) of a predetermined microwave or millimeter-wave carrier frequency, where n is an integer greater than 1;

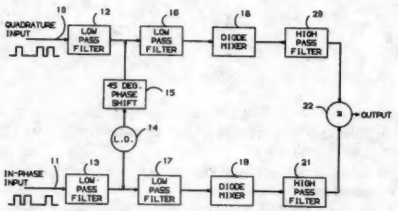
a first mixer disposed in the first rail for modulating the first digital signal and the in-phase subharmonic pump carrier signal to generate an output signal modulating along a first axis;

a second mixer disposed in the second rail for modulating the second digital signal with the 90°/n subharmonic pump carrier signal to generate an output signal modulating along a second axis which is orthogonal to the first axis; and

means for combining the output signals from the first and second mixers to generate a QPSK output signal.

11. A Quadrature Phase Shift Keying (QPSK) demodulator comprising:

an input terminal for receiving a QPSK input signal comprising a first and a second digital signal modulated along a first and a second orthogonal axis, respectively, with a predetermined microwave or millimeter-wave carrier signal;



a first and second output terminal;

means for dividing the QPSK input signal along a first and a second portion thereof for propagation along a first and a second rail, respectively;

means for coupling an in-phase and a 90°/n subharmonic pump carrier into the first and second rail, respectively, the pump carrier signal comprising a frequency which is a submultiple 1/n of the predetermined microwave or millimeter-wave carrier signal and is synchronized thereto, where n is an integer greater than 1;

a first mixer disposed in the first rail for modulating the first portion of the QPSK input signal and the in-phase subharmonic pump carrier signal to generate a first output signal comprising only the first digital signal received in the QPSK input signal for transmission to the first output terminal; and

a second mixer disposed in the second rail for modulating the second portion of the QPSK input signal and the 90°/n subharmonic pump carrier signal to generate a second output signal comprising only the second digital signal received in the QPSK input signal for transmission to the second output terminal.

4,612,519

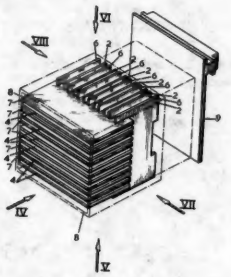
SWITCH ASSEMBLY AND CIRCUIT

Eric J. Gargini, West Drayton, and Gideon Kalanit, New Malden, both of England, assignors to Communications Patents Limited, London, England

Filed Jan. 11, 1985, Ser. No. 690,520
Claims priority, application United Kingdom, Jan. 14, 1984, 8401002
Int. Cl.⁴ H01P *1/15*
U.S. Cl. 333—103 **9 Claims**

1. A switch assembly for connecting any one of a plurality of inputs each carrying a plurality of frequency distinguished signals to any one of a plurality of outputs, comprising an input

board connected to each input and an output board connected to each output, the input boards being arranged in parallel and each supporting a solid state switch, each input board solid state switch being connected between the input to the board and a respective terminal located adjacent the board edge, the output boards being arranged in parallel so as to be substantially perpendicular to the input boards and each supporting a solid state switch, each output board solid state switch being connected between the output of the board and a respective terminal located adjacent the board edge, and each output board terminal engaging a respective input board terminal so that the terminals supported by any one output board engage

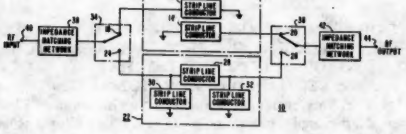


terminals supported by respective ones of the input boards, wherein the adjacent pairs of parallel boards are isolated from each other by electrically conducting isolating plates interleaved with and extending parallel to the boards, the isolating plates comprising a first group located between the input boards and extending into the spaces between the output boards, and a second group located between the output boards and extending into the spaces between the input boards to form a series of four sided isolating structures within each of which the terminals of a respective pair of interengaging terminals are located and shielded to prevent crosstalk between the interengaged sets of terminals.

4,612,520
WIDEBAND 180-DEGREE PHASE SHIFTER BIT

Daniel C. Boire, Ferndale; James E. Degenford, Ellicott City, and Marvin Cohn, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1985, Ser. No. 740,355
Int. Cl.[4] H01P *1/18*
U.S. Cl. 333—156 **4 Claims**



1. A wideband 180-degree phase shifter bit operable independently of input frequency over a predetermined bandwidth of interest to produce a 180-degree phase shifted rf output comprising;

(a) coupled transmission line segments with opposed ends of each line being connectable respectively to rf input and rf output, with the other end of each line being grounded;

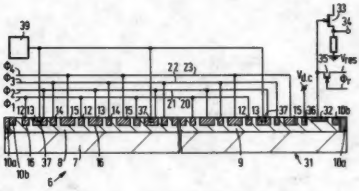
(b) a pi network transmission line segment having a central line portion having opposed ends from which extend grounded line portions, and which opposed ends are respectively connectable to the rf input and rf output; and

(c) switching means for alternatively connecting the rf input and rf output to the coupled transmission line segments and to the pi network.

4,612,521
CHARGE-COUPLED TRANSVERSAL FILTER

Marcus Kleefstra, Delft; Antonius J. M. Montagne, and Jan W. Pathuis, both of Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 12, 1985, Ser. No. 710,826
Claims priority, application Netherlands, Mar. 14, 1984, 8400805
Int. Cl.[4] H03H *15/02*; H03K *5/153*
U.S. Cl. 333—165 **5 Claims**



1. A charge-coupled transversal filter comprising a charge-coupled device having a plurality of series-connected stages, each comprising first means for supplying an input signal, second means for forming a plurality of weighted signals from this input signal by multiplying this input signal by weighting factors and by which the weighted signals are introduced in parallel into said stages of the charge-coupled device, an output, and third means for transporting the introduced signals through the charge-coupled device to said output, which output is connected to reading means, the charge-coupled device being of the buried channel type and having a semiconductor body and a charge transport channel located at a surface of said semiconductor body and having the form of a surface layer mainly of a first conductivity type, which can be depleted throughout its thickness and is provided with a row of electrodes which form part of said third means and comprise a group of surface zones of the second conductivity type, which zones are each associated with one of the said stages of the charge-coupled device, a zone of the first conductivity type provided adjacent each of the surface zones which is separated from the semiconductor layer of the first conductivity type by an intermediate part of the associated surface zones of the second conductivity type, and means for converting the input signal into an electrical current, the value of which is determined by the amplitude of the input signal, the surface areas of the zones of the first conductivity type comprising said weighting factors, and these zones of the first conductivity type being commonly connected to a connection to which said current is supplied.

4,612,522
MASK PROGRAMMABLE CHARGE COUPLED DEVICE TRANSVERSAL FILTER

Rudolph H. Dyck, Palo Alto, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

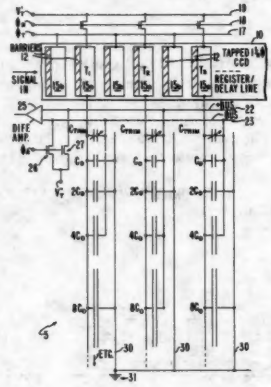
Filed May 10, 1982, Ser. No. 376,894
Int. Cl.[4] H03H *15/02*; H03K *5/159*; G11C *19/28*
U.S. Cl. 333—165 **6 Claims**

1. A filter comprising:

a charge coupled device delay line comprised of individual charge storage elements for receiving an incoming electri-

cal signal, the delay line containing a plurality of charge-sensing elements for sensing charge in the individual charge storage elements of said delay line;

a plurality of capacitors coupled to each said charge sensing element;



an output circuit;

a bus for connecting selected capacitors associated with each said charge-sensing element to said output circuit; and

wherein the plurality of capacitors have values of capacitance which comprise binary scaled sets.

4,612,523

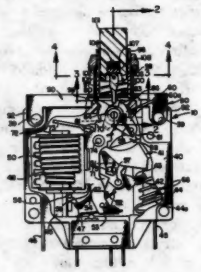
CIRCUIT BREAKER MECHANISM

James M. Mercer, Trenton, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Filed Nov. 15, 1984, Ser. No. 671,750

Int. Cl.[4] H01H *77/02*

U.S. Cl. 335—26 **10 Claims**



1. A circuit breaker mechanism comprising:

(A) a frame;

(B) a pair of contacts supported relative to the frame, said contacts being displaceable relative to one another between an open and a closed position;

(C) a bell crank pivotable on said frame between a first and second stable position, said bell crank having a deflecting surface and a cam surface;

(D) a linkage assembly coupled with said bell crank and at least one of said contacts, said linkage assembly being displaceable to open and close said contacts;

(E) a push-button actuator movably supported relative to said frame, said push-button actuator being adapted to engage the cam surface of the bell crank in its first stable position to displace said bell crank from the first stable position into its second stable position so as to displace said linkage assembly to close said contacts, and said push-button actuator being adapted to engage the deflecting surface of the bell crank in the second stable position so that the push-button actuator is deflected by the deflecting surface of the bell crank to prevent displacement of the bell crank from its second stable position; and

(F) an electrical actuator on said frame for acting on said linkage assembly under predetermined conditions to open said contacts and enable displacement of said bell crank from the second stable position to its first stable position.

4,612,524

DEFLECTION COIL SYSTEM FOR A PICTURE DISPLAY TUBE

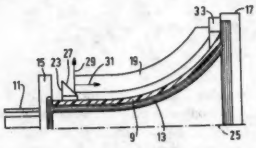
Adriaan J. Groothoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,615

Claims priority, application Netherlands, Dec. 7, 1983, 8304215

Int. Cl.[4] H01F *7/00*

U.S. Cl. 335—210 **4 Claims**



1. A deflection coil system for a picture display tube comprising a support which is manufactured from an electrically insulating synthetic resin and has a rear portion for fitting around the neck of a picture display tube for which purpose the support has a flared shape, said support being surrounded on the outside by an annular ferromagnetic core which supports toroidal deflection coils, characterized in that a number of outwardly directed resilient members extending substantially perpendicularly to the axis of the support are formed on the support adjacent the rear portion thereof which members, on their sides directed towards the front portion of the support, each have a face which is inclined with respect to the said axis and engage the rear side of the core in such manner that the members centre the core with respect to the said axis by the exertion or radially outwardly directed forces on said core whilst in addition urge the core against an abutment on the front portion of the support by the exertion of axially forwardly directed forces on the core.

4,612,525

METHOD OF MANUFACTURING A SADDLE-SHAPED DEFLECTION COIL FOR A PICTURE DISPLAY TUBE AND DEFLECTION SYSTEM HAVING SADDLE-SHAPED DEFLECTION COILS

Albertus A. S. Sluyterman, and Nicolaas G. Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,604

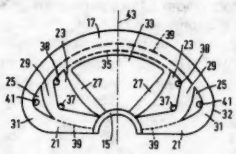
Claims priority, application Netherlands, Mar. 21, 1984, 8400886

Int. Cl.[4] H01F *5/00*

U.S. Cl. 335—213 **6 Claims**

1. A method of continuously winding saddle-shaped flared deflection coils (9) for picture display tubes, said coils being wider at their front side than at their rear side, in which the turns of the coil are distributed over a number of sections and in which each turn of a section surrounds the turns of the preceding sections and each pair of adjacent sections is sepa-

rated over a part of its length by at least one aperture which is formed in that in at least one previously determined place along the boundary between the two sections after providing the number of turns desired for the first of the said two sections a pin extending approximately at right angles to the plane of



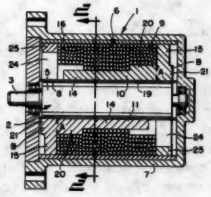
the turns is provided in the winding space, after which the second section is wound around said pin, characterized in that for the formation of at least one of the apertures pins are provided substantially simultaneously into the winding space in at least two places on the same side of the plane of symmetry of the coil.

4,612,526

TORQUE MOTOR WITH HIGH TORQUE POLES AND MAGNETIC CENTERING SPRING ADJUSTMENT

Robert D. Vanderlaan, and William H. Eiszner, Jr., both of Kalamazoo, Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Dec. 21, 1984, Ser. No. 685,036
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—229 **30 Claims**



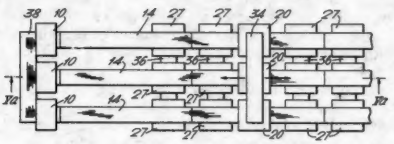
1. A limited angle torque motor comprising a rotor assembly and a stator assembly, said rotor assembly including a rotor shaft mounted for rotation relative to said stator assembly and a permanent rotor magnet mounted for rotation with said rotor shaft, said rotor magnet being diametrically oriented, and said stator assembly including a stator coil and a pair of circumferentially spaced stator pole structures, each said stator pole structure comprising a generally axially extending stator pole blade about which said stator coil circumferentially extends, and a radially outwardly extending flange at one end of one of said stator pole structures and at the opposite end of the other of said stator pole structures, said blades having a greater radial thickness adjacent the respective flanges than at the opposite ends of said blades to reduce the magnetic flux density of said stator pole structures in the region of said blades adjacent said flanges, thereby extending the torque versus current characteristic of said motor due to interaction of magnetic fields.

4,612,527

ELECTRIC POWER TRANSFER SYSTEM

Sinclair M. Third, Wantage, and Edward Abel, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 10, 1984, Ser. No. 639,337
Int. Cl.[4] H01F *33/00, 17/04*
U.S. Cl. 336—5 **7 Claims**



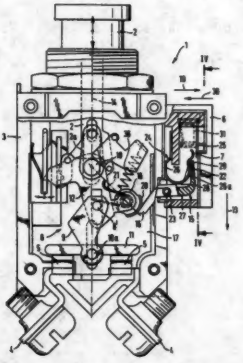
1. An alternating current electric power transfer system comprising a transformer means, said transformer means comprising: a first magnetic core portion defining at least three spaced-apart regions thereof which extend in a direction along which power supply is to be provided; a first winding wound around each region of said first core portion; a second magnetic core portion of limited extent in the said direction, providing a low reluctance flux path between the spaced-apart regions of the first core portion so as to complete a magnetic flux circuit therewith, and being movable relative to the first core portion along the said direction; at least three second windings wound around the second core portion, whereby polyphase electric power may be transferred; and an auxiliary primary winding wound around each region of the first core portion remote from the first winding.

4,612,528

SINGLE OR MULTIPLE POLE OVERLOAD PROTECTIVE CIRCUIT BREAKER HAVING AN INTEGRATED SIGNAL CONTACT POINT

Josef Peter, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen, Altdorf, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,630
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428637
Int. Cl.[4] H01H *71/04, 73/12*
U.S. Cl. 337—79 **22 Claims**



1. A manually or thermally operable overload protective circuit breaker comprising at least one pole,

a housing of electrically insulating material, having a central longitudinal axis,

a main switch chamber in said housing, an actuating element

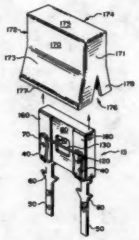
accessible from the outside of said housing and being arranged displaceably along said central longitudinal axis,
at least two contact posts associated with said housing,
an elbow lever lodged in said main switch chamber and comprising an actuating arm, a main contact arm and an elbow joint, each of said two arms having a first arm end at which the arms are articulatedly connected with each other by said elbow joint, and a second arm end remote from said elbow joint,
contact-making bridge means being responsively connected with said actuating element by means of said elbow lever for making or breaking contact between said two contact posts,
restoring means for permanently biassing said elbow lever toward a contact-breaking position,
a first swivel joint articulatedly connecting said second end of said actuating arm with said actuating element,
a second swivel joint articulatedly connecting said second end of said main contact arm with said contact-making bridge means,
said elbow lever being movable between a stretched position making circuit and a folded position breaking circuit, said first and second swivel joints being both located, in both said stretched and folded positions as well as in any transitional position therebetween, on said central longitudinal axis, or substantially thereon,
an attachment casing mounted on said housing, a signal contact lever comprising a fulcrum, a trip lever arm projecting from said fulcrum into said main switch chamber, and a signal contact arm extending into said casing,
a fixed contact and a signal contact spring being both lodged in said housing and forming a signal contact point therebetween;
said actuating arm of said elbow lever comprising tripping means projecting therefrom in the region of said first arm end thereof and being adapted for engaging said signal contact lever when said elbow lever is in stretched position,
and said signal contact arm is adapted for carrying out a swivel movement dependent on the position of said tripping means, and thereby acting upon said signal contact spring so as to make or break circuit with said fixed contact at said signal contact point.

4,612,529

SUBMINIATURE FUSE

Leon Gurevich, St. Louis, and Vernon Spaunhorst, Washington, both of Mo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 25, 1985, Ser. No. 715,799
Int. Cl.[4] H01H *85/14*
U.S. Cl. 337—255 **26 Claims**



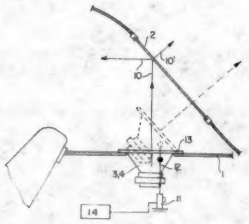
1. An electrical circuit protector which is adapted to be inserted into a printed circuit board, comprising:
(a) a first terminal and a second terminal each having a top portion and a bottom portion;
(b) insulating means having two ends for electrically and thermally insulating said first terminal from said second terminal and for holding said first terminal and said second terminal in substantially parallel relationship and spaced apart from each other by a predetermined distance, said top portions of said first terminal and said second terminal being disposed intermediate the ends of said insulating means;
(c) a fusible conductor connected between said first terminal and said second terminal and supported on said insulating means, the combination of said insulating means, said fusible conductor, and the portions of said first terminal and said second terminal defining an assembly;
(d) an electrically insulative material coating said assembly; and
(e) unitary one piece enclosure means for housing said assembly.

4,612,530

MOTOR VEHICLE ALARM SYSTEM WITH ACOUSTIC SIGNAL EMISSION VIA AT LEAST ONE RADIO LOUDSPEAKER INSTALLED INTO THE MOTOR VEHICLE

Hermann Kurth, and Peter Robitschko, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,509
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413769
Int. Cl.[4] B60R *25/00*; G10K *5/04*
U.S. Cl. 340—63 **13 Claims**



1. An alarm system for a vehicle comprising:
speaker means pivotably disposed inside said vehicle for emitting sound;
alarm means for sensing physical contact with said vehicle, said alarm means transmitting signals upon sensing said contact; and
control means for receiving said signals from said alarm means, said control means causing pivoting of said speaker means upon receipt of said signals and emitting of an alarm signal.

4,612,531

INTERMESHED RESISTOR NETWORK FOR ANALOG TO DIGITAL CONVERSION

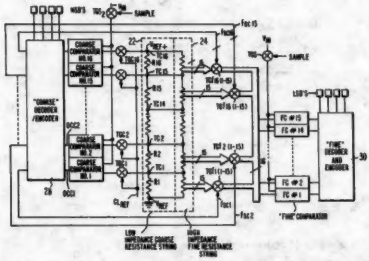
Andrew G. F. Dingwall, Bridgewater Township, Somerset County, and Victor Zazzu, Boro of Montvale, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 12, 1985, Ser. No. 700,866
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **8 Claims**

1. In an "n"-bit analog-to-digital converter, where "n" is an integer greater than 2, a network for producing 2^n reference voltage increments comprising:
first and second terminals for the application therebetween of a reference potential;
a coarse, relatively low impedance, resistive network connected between said first and second terminals; said coarse network being divided into 2^x coarse segments for produc-

ing 2^x substantially equal ohmic increments; where x is an integer and is less than n; and

a fine resistive element for each one of said 2^x coarse segments; each one of said fine resistive elements being connected in parallel with its corresponding coarse segment and each one of said fine resistive elements having a relatively high impedance compared to the coarse segment across which it is connected; each one of said fine elements being subdivided into $2^{(n-x)}$ fine sub-segments.



4,612,532

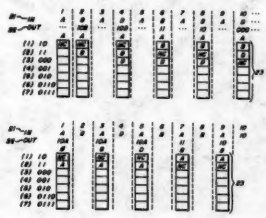
DATA COMPRESSION APPARATUS AND METHOD

Francis L. Bacon, and Donald J. Houde, both of Wayland, Mass., assignors to Telebyte Corportion, Natick, Mass.

Filed Jun. 19, 1984, Ser. No. 622,547

Int. Cl.[4] H03M 7/00

U.S. Cl. 340—347 DD 18 Claims



1. A system for the dynamic encoding of a stream of characters, the system comprising:

an input for receiving the stream of characters;

an output for providing encoded data;

means, hereinafter referred to as "followset means," connected to the input, for storing, accessing, and updating, for each given character of a plurality of characters, a table listing the set of candidates for the character which may follow the given character in the stream, such table hereinafter referred to as a "followset table";

followset identification means, connected to the input, for identifying the followset table, hereinafter the "given followset table," for that character which immediately precedes a given character in the stream at the input;

position encoding means for providing at the output, for the given character, a signal indicative of the position, occupied by the given character, in the followset table identified by the followset identification means; and

updating means for updating a given followset table periodically when the position of a candidate therein has been signaled by the encoding means at the output, by interchanging the position of such candidate, unless such candidate is at the top of the followset table, with the position of a candidate thereabove in the given followset table.

4,612,533

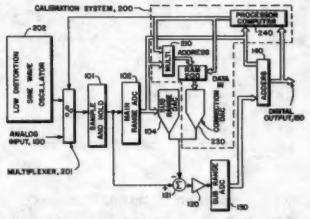
HARMONIC DISTORTION REDUCTION TECHNIQUE FOR DATA ACQUISTION

William P. Evans, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 12, 1985, Ser. No. 743,853

Int. Cl.[4] H03M 1/10

U.S. Cl. 340—347 CC 7 Claims



1. A self-calibrating analog-to-digital converter which receives an analog input signal and outputs a digital signal while reducing harmonic distortion, said self-calibrating analog-to-digital converter comprising:

a sample and hold circuit, which conducts analog signals;

a main range encoder, which produces a digital word signal (N_1) by quantizing analog signals received from said sample and hold circuit;

a subrange digital-to-analog converter which produces an output signal by receiving and converting into analog, said digital word signal from said main range encoder;

a digital calibration means, which receives the digital word signal (N_1) produced by said main range encoder, said digital calibration means outputting a digital harmonic distortion signal by extracting the harmonic distortion from the digital word signal (N_1) signal produced by said main range encoder;

a calibration digital-to-analog converter which produces an analog correction signal by receiving and converting to analog said digital harmonic distortion signal from said digital calibration means;

a differencing means which produces a corrected composite signal by subtracting said output signal received from said subrange digital-to-analog converter and said analog correction signal received from said calibration digital-to-analog converter, from analog signals received from said sample and hold circuit;

a subrange encoder which produces a calibrated output byte signal (N_2) by quantizing said corrected composite signal received from said differencing means; and

a digital adding means which outputs said digital signal of said self-calibrating analog-to-digital converter by adding the digital word signal (N_1), received from said main range encoder, with said calibrated output byte signal (N_2), received from said subrange encoder.

4,612,534

METHOD OF TRANSMITTING MEASURING VALUES IN A MONITORING SYSTEM

Richard Bliehler, San Diego, Calif.; Jürg Muggli, Männedorf, Switzerland; Andreas Scheidweiler, Jona, Switzerland, and Eugen Schibli, Uerikon, Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Apr. 19, 1983, Ser. No. 494,966

Claims priority, application Switzerland, Apr. 28, 1982, 2589/82

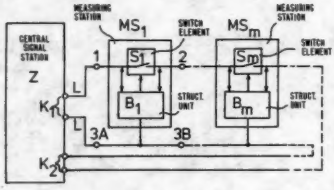
Int. Cl.[4] G08B 26/00

U.S. Cl. 340—505 10 Claims

2. In a method of transmitting measured values in a monitoring system containing individual monitoring measuring sta-

tions cascade connected via signal lines to a first pair of terminals of a central signal station, each measuring station being provided with at least one switching element and at least one address storage, comprising the steps of:

applying a voltage signal to the signal lines in order to disconnect all of the measuring stations from the central signal station;



applying by means of said central signal station in a timewise staggered succession respective predetermined addresses to said measuring stations by respectively infeeding said predetermined addresses into the respective address storages of said measuring stations; and

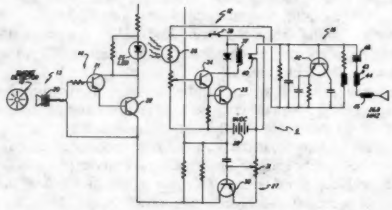
blocking the applied address in each address storage before a next following measuring station is reconnected with the signal lines.

4,612,535

ADD-ON ALERT SYSTEM

Kenneth Sequin, Star Rte., and Edward F. Burke, P.O. Box 26, both of Massena, N.Y. 13662

Filed Nov. 1, 1984, Ser. No. 667,341
Int. Cl.[4] G08B *1/08*
U.S. Cl. 340—539 **14 Claims**



10. In an emergency signaling system that includes

a detector located inside a building for generating an audible signal when an emergency condition is sensed,

an audio pick-up means located in close proximity with the detector inside the building for energizing an optical isolator when an audible signal is generated,

a relay means connected to the optical isolator for closing a contact in an alarm circuit located outside the building when the optical isolator is energized,

said alarm circuit having an independent power supply connected to an alarm means through said contact whereby the alarm means is enabled when the contact is closed, and

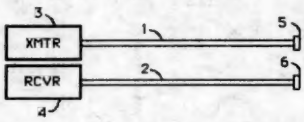
holding means for maintaining the alarm means enabled once the contact is closed even if the detector and audio pick-up means are destroyed during said emergency condition.

4,612,536

DUAL VELOCITY LEAKY CABLE INTRUSION DETECTOR SENSOR

R. Keith Harman, Kanata, Canada, assignor to Senstar Security Systems, Corporation, Ontario, Canada

Filed Oct. 2, 1984, Ser. No. 656,929
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—552 **22 Claims**



1. A sensor for use in a leaky cable intrusion detector system comprising:

(a) a radio frequency signal transmitter,

(b) a receiver for receiving said signal, and

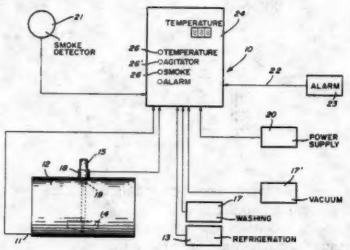
(c) a pair of cables for location in parallel but spaced relationship, a first one of which is adapted to be coupled to the transmitter for radiating the signal along its length, and the other being adapted to be coupled to the receiver for receiving the radiated signal along its length from the first cable, the velocity propagation factors of the cables being different from each other.

4,612,537

ALARM SYSTEM FOR MONITORING THE TEMPERATURE OF A LIQUID CONTAINED IN A RESERVOIR

André Maltais, Délisle, and André Nadeau, Beloeil, both of Canada, assignors to Maritonex Inc., Quebec, Canada

Filed Jan. 28, 1985, Ser. No. 695,186
Int. Cl.[4] G08B *19/00*; A01J *9/04*
U.S. Cl. 340—596 **5 Claims**



1. An alarm system for monitoring the temperature of milk contained in a reservoir, said system comprising a temperature sensing probe secured to said reservoir for sensing the temperature of said milk and connected to an input of said system, a sensing circuit associated with said probe to generate a temperature indicating analog signal representative of said milk temperature, a calibration circuit for calibrating said temperature signal relative to a reference signal, converter means to convert said calibrated temperature signal to a binary signal indicative of sensed temperatures of said milk to feed comparator circuits having preset limit detectors to initiate an alarm signal through an alarm circuit when said temperature binary signal exceeds a predetermined value, said comparator circuits feeding a display device to indicate the temperature of said milk, an agitator device in said reservoir, said agitator device being connected to a drive motor through a shaft, a bi-polar hall-effect switch associated with said shaft to monitor the state of said motor, said switch being energized by a magnet secured to said shaft, a timer/oscillator circuit associated with said switch

whereby to generate an alarm signal to said alarm circuit after a predetermined time delay if said motor has not resumed its initial state, said converter means being an analog/digital converter, said calibration circuit having a reference voltage signal circuit which is connected to said converter to feed a fixed reference signal for comparison with said analog output signal of said calibration circuit and having a potentiometer to fix said reference signal, said converter further having three groups of output lines, two of said groups having signals indicative of tens of degrees and the third group having signals indicative of one-tenth of a degree, said groups of signals being associated with a respective light emitting diode, said two groups of signals indicative of tens of degrees being connected to said comparators which comprise four CMOS 4-bit magnitude comparators coupled with a limit switch to preset upper and lower temperature limits that will trigger an alarm signal to an alarm circuit when said limits are exceeded, comparators connected to two coding circuits associated with a respective one of said light emitting diodes, said third group of signals indicative of one-tenth of a degree being connected directly to a coding circuit associated with a further light emitting diode, said diodes providing a visual indication of the actual temperature of said liquid being monitored.

4,612,538

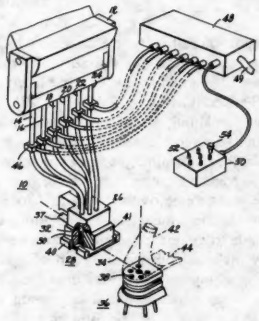
NAIL DETECTOR SYSTEM

Ralph E. Karcher, Jr., Magnolia, Mass., assignor to Emhart Corporation, Hartford, Conn.

Filed Oct. 14, 1983, Ser. No. 542,012

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—679 **17 Claims**



1. A system for detecting the transfer of nails from a first station within a nailing machine to a second station within the machine wherein the nails are arranged in a nailing pattern at the second station, said system comprising:

means for sensing the passage of nails from the first station to the second station wherein the nails are arranged in the nailing pattern;

means, responsive to the sensing of the passage of nails, for accounting for each nail that is to be present in the nailing pattern; and

means, responsive to said accounting means, for alerting the operator of the nailing machine at a predetermined time prior to a nailing operation of the nailing machine when at least one nail is missing from the nailing pattern.

4,612,539

X—Y POSITION INPUT DEVICE FOR DISPLAY SYSTEM

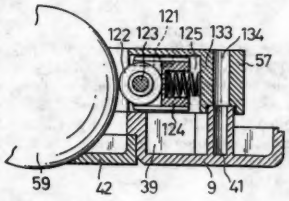
Junichi Hosogoe; Motoyuki Suzuki, and Yuichi Ida, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 8, 1984, Ser. No. 587,353

Claims priority, application Japan, Mar. 9, 1983, 58-32766[U]

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—710 **3 Claims**



1. An X-Y input device comprising a rotatable ball, a first driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, a second driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, said second driven roller having an axis of rotation extending substantially perpendicularly to that of said first driven roller, first rotation detector means for detecting an amount of rotation of said first driven roller, second rotation detector means for detecting an amount of rotation of said second driven roller, and frictional force imposing means for resiliently urging said ball against said first and second driven rollers to impose frictional forces between said ball and said driven rollers, said frictional force imposing means comprising a contact roller held in rolling contact with said ball and having a shaft, a slidable roller support having bearings supporting opposite ends of said shaft and a spring bearing, a fixed member having a spring bearing opposite to said spring bearing of said slidable roller support, and a coil spring interposed under compression between said spring bearing of said slidable roller support and said spring bearing of said fixed member for normally urging said contact roller against said ball.

4,612,540

DIGITAL DISPLAY SYSTEM

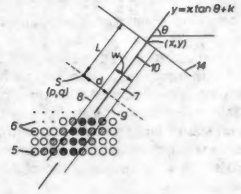
John M. Pratt, Macclesfield, England, assignor to International Computers Limited, London, England

Filed Apr. 25, 1983, Ser. No. 488,368

Claims priority, application United Kingdom, Apr. 30, 1982, 8212587

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—793 **4 Claims**



1. A method of setting intensity values for an array of picture elements to form an image of a linear feature, the method comprising scanning a plurality of paths that intersect said linear feature, each path comprising a succession of said picture elements, the scanning of each path comprising:

(a) sampling each picture element in the path in turn,

(b) calculating a distance value between the sampled picture element and said linear feature,

(c) utilizing the distance value calculated in step (b) above to derive an intensity value having one of several possible values for the sampled picture element, and setting the sampled picture element to that intensity value, and

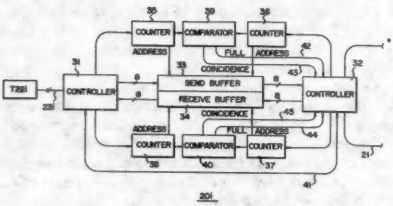
(d) comparing the intensity value calculated in step (c) above with a predetermined limit value and, when the predetermined limit value is reached, terminating the scanning of the path and initiating scanning of a next one of said plurality of paths.

4,612,541

DATA TRANSMISSION SYSTEM HAVING HIGH-SPEED TRANSMISSION PROCEDURES

Yoshiichi Ohnishi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 26, 1983, Ser. No. 545,775
Claims priority, application Japan, Oct. 27, 1982, 57-188613
Int. Cl.⁴ H04Q *9/00*; H04J *3/08*
U.S. Cl. 340—825.05 **4 Claims**



1. A data transmission system comprising:

a plurality of data transmission apparatuses;

a high-speed transmission line connected to said plurality of data transmission apparatuses; and

at least one terminal connected to each of said data transmission apparatuses, respectively thereby performing communication between said terminals in accordance with high-speed transmission procedures, each said terminal comprising:

means for transferring a send request signal to an associated data transmission apparatus among said plurality of data transmission apparatuses at the time of data transmission,

means for decoding a command transmitted from said associated data transmission apparatus and for transferring to said associated data transmission apparatus transmission data for a desired, distant terminal among said terminals when the command is a transmission start command, and transferring a reception start signal thereto when the command is a reception request command,

means for receiving reception data from said associated data transmission apparatus after transferring said reception start signal, and

means for transmitting a transmission end signal to said associated data transmission apparatus when status data received from said associated data transmission apparatus after said reception start signal is transferred is transmission end status data and for transmitting a reception end signal to said associated data transmission apparatus when said status data received therefrom is reception end status data; and

each of said plurality of data transmission apparatuses comprising:

means for receiving transmission data from an associated terminal among said terminals and for transmitting said transmission data to a data transmission apparatus associated with a distant terminal through said high-speed transmission line,

means for transferring a reception request command to said distant terminal while receiving transmission data for said distant terminal though said high-speed transmission line,

means for transferring a send request command to said associated terminal in response to a send request signal from said associated terminal,

means for transferring the data received through said high-speed transmission line to said distant terminal in response to a reception start signal from said distant terminal, and

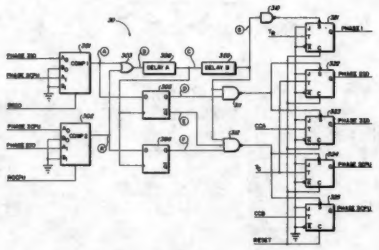
means for transferring to said associated terminal a transmission end status signal when the transmission data has been received by said transmission apparatus associated with said distant terminal and transferring a reception end status signal thereto when reception data received through said high-speed transmission line is transferred to said distant terminal.

4,612,542

APPARATUS FOR ARBITRATING BETWEEN A PLURALITY OF REQUESTOR ELEMENTS

William J. Pantry, Portland, Oreg., and Burke B. Baumann, Glendale, Ariz., assignors to Honeywell Inc., Phoenix, Ariz.

Filed Dec. 20, 1984, Ser. No. 684,312
Int. Cl.⁴ H04Q *9/00*
U.S. Cl. 340—825.5 **8 Claims**



1. An arbitration circuit, for determining which one of a plurality of request signals from a plurality of requestors is to be acknowledge and granted access to a bus having an associated bus controller, comprising:

(a) a plurality of enabling means, each enabling means having an input terminal adapted to receive one of said request signals, for determining when predetermined conditions exist to transmit the request signal;

(b) first gate means, operatively connected to each of said plurality of enabling means, for combining transmitted request signals to generate a combined request signal;

(c) a plurality of first latch means, each of said first latch means having a sequential priority order and operatively connected to a corresponding enabling means, and further connected to the output of said first gate means, each of said first latch means for generating an enable signal and a disable signal; and

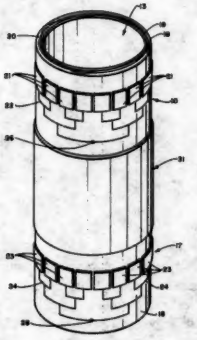
(d) a plurality of second gate means, each of said second gate means operatively connected to said first gate means to receive said combined request signal, and each of said second gate means operatively connected to the corresponding first latch means to receive the enabling signal, and further each of said second gate means operatively connected to each first latch means having a higher sequential priority to receive the disabling signal from each of said higher sequential priority first latch means, each of said second gate means for generating a select control signal corresponding to the request signal selected by the arbitration circuit thereby permitting that requestor access to the bus.

4,612,543

INTEGRATED HIGH-GAIN ACTIVE RADAR AUGMENTOR

James M. DeVries, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1983, Ser. No. 491,686
Int. Cl.[4] G01S *13/74*
U.S. Cl. 343—5 R 16 Claims



14. An integrated and compact high-gain active radar augmentor for enhancing radar visibility, comprising:

a. An omni-directional receive antenna;

b. an omni-directional transmit antenna;

c. an RF absorbing means for isolating said receive antenna from said transmit antenna;

d. said receive antenna and said transmit antenna being integrally mounted on either side of said RF absorbing means such that required isolation between the two antennas is achieved by the strategic placement of said RF absorbing means between the two antennas;

e. a filter means connected to said receive antenna for selecting the band of input frequency to be processed;

f. a high-gain RF amplifier connected to the output of said filter means for amplifying the selected signal frequency band;

g. the isolation between said receive antenna and said transmit antenna being greater than the gain of said RF amplifier;

h. said transmit antenna being connected to the output of said RF amplifier for re-radiating the amplified selected band of input frequency omni-directionally, and means provided for measuring the power re-radiated by said transmit antenna;

i. said receive antenna, said RF absorbing means, and said transmit antenna being axially mounted on and about and forming a portion of an RF conducting housing which encloses said filter means, said RF amplifier and related equipment; said RF conducting housing also operating to provide isolation between the two antenna;

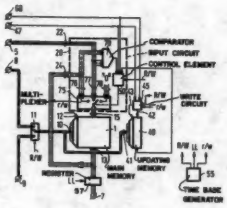
whereby simultaneous reception, amplification and re-transmission of select radar signals is provided that enhance the radar visibility.

4,612,544

MEMORY ARRANGEMENT WITH ORDERED WRITING PARTICULARLY INTENDED FOR COOPERATION WITH A RADAR IMAGE DISPLAY UNIT

Jean P. X. Da Silva, Sartrouville, and Jean-Yves M. Guiglini, Argenteuil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,376
Claims priority, application France, Jul. 7, 1982, 82 11926
Int. Cl.[4] G01S *7/04;* G06F *12/00*
U.S. Cl. 343—5 DP 5 Claims



1. A memory arrangement for storing radar data for use by a display unit, said arrangement comprising:

(a) a main memory having a multiplicity of addressable memory locations for storing respective data words;

(b) an input circuit having an output electrically connected to a data input of the main memory, an input for receiving data words to be stored in said main memory at respective ones of the memory locations, and a control element for controlling the writing of data words into the main memory;

(c) memory means having a multiplicity of addressable memory locations corresponding to those in the main memory; and

(d) a write circuit having an output electrically connected to a data input of the memory means and an input for receiving an updating signal indicating whether the main memory is being updated with new data words, said write circuit effecting the writing in said memory means of:

1. a predetermined first word in each memory location for which a new data word is written into the corresponding memory location in the main memory; and

2. a predetermined second word in all other memory locations;

said control element having an input electrically connected to an output of the memory means for periodically receiving the predetermined first and second words stored in said memory means, said control element periodically effecting writing an invalidation data word in all memory locations of the main memory corresponding to memory locations in said memory means from which one of the predetermined second words is received.

4,612,545

AUTOMATIC FREQUENCY IDENTIFIER FOR RADAR SIGNALS

Robert H. Asendorf, Los Altos; James P. Fitzpatrick, Santa Clara, and Burton W. Graves, Monte Sereno, all of Calif., assignors to Itek Corporation, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 327,281, Dec. 3, 1981, abandoned. This application Jul. 24, 1984, Ser. No. 633,823
Int. Cl.[4] G01S *7/36;* G01R *23/16*
U.S. Cl. 343—18 E 15 Claims

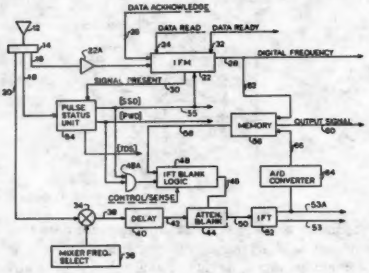
1. In combination:

An IFM receiver (22), including a limiting amplifier (22A) for limiting the amplitude of a signal delivered thereto, for producing a SIGNAL PRESENT signal indicative of the presence of such signal, for producing a first DIGITAL

FREQUENCY signal which is a digital measure of such signal, and for producing a DATA READY signal indicative of the presence of the digital frequency signal;

A pulse status unit, responsive to said SIGNAL PRESENT signal for producing at least a (SSD) signal, and a (PWD) signal, said (SSD) signal being delivered to said IFM as a tag signal for said DIGITAL FREQUENCY signal;

An IFT receiver, blanking means for inhibiting the input to said IFT receiver, delay means for delaying the input to said IFT receiver, and heterodying means for shifting input signals into the frequency range of said IFT receiver;



Means for channeling incoming radio frequency pulses to said IFM receiver, said IFT receiver and said pulse status unit;

Blanking logic means responsive to said PWD signal for controlling said blanking means;

An analog/digital converter connected between the output of said IFT receiver to convert the output of said IFT into digital form; and

Memory means for receiving and storing said DIGITAL FREQUENCY signal from said IFM and frequency information from said analog/digital converter.

4,612,546

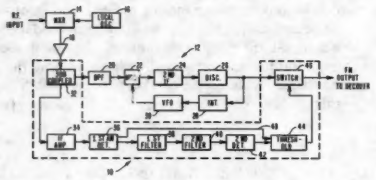
SATELLITE COMMAND LINK PROTECTION SYSTEM

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 30, 1982, Ser. No. 373,766

Int. Cl.[4] H04B 7/185

U.S. Cl. 343—352 **9 Claims**



8. A satellite command link protection system for use in combination with a satellite beacon tracking receiver and satellite control means to preclude an intruder from acquiring control of a satellite comprising:

first means for detecting an AM signal and isolating said signal from a beacon to provide a DC signal;

comparator means for comparing the DC signal to a first threshold to provide an output signal which represents the presence of an intruder signal of a predetermined signal strength; and

switch means operatively connected to said comparator means for decoupling said satellite receiver from said satellite control means whenever the output of said first means exceeds a predetermined threshold.

4,612,547

ELECTRONICALLY SCANNED ANTENNA

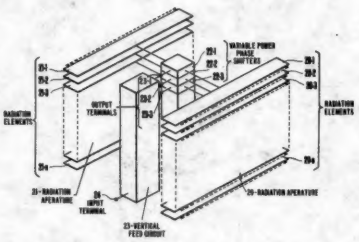
Shin-ichi Itoh, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 2, 1983, Ser. No. 529,030

Claims priority, application Japan, Sep. 7, 1982, 57-155468; Sep. 10, 1982, 57-157484

Int. Cl.[4] G01S 5/02

U.S. Cl. 343—372 **33 Claims**



1. An electronically scanned antenna comprising N independent radiation aperture units adapted to form N radiation beams in a first radiation plane, where $N>1$, and a plurality of beam control means having a power variable distribution performance and a phase control performance, each said control means comprising a power distributor equally distributing an input signal, a pair of electronically variable phase shifters connected to respective output terminals of said power distributor, and a 90° hybrid coupler inputted with a pair of output signals of said electronically variable phase shifters, said pair of electronically variable phase shifters being responsive to respective external control signals for switching of the radiation beams and setting of radiation power ratio for the respective radiation beams to any desired values in said first radiation plane regarding said N radiation beams and radiation beam scanning in a second radiation plane orthogonal to said first radiation plane in a predetermined reference direction with reference to said first radiation plane in which said N radiation beams are formed.

4,612,548

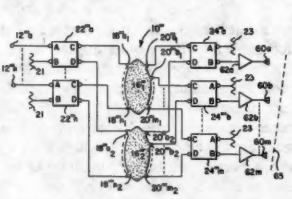
MULTI-PORT RADIO FREQUENCY NETWORKS FOR AN ANTENNA ARRAY

Fernando Beltran, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 616,449, Jun. 1, 1984, abandoned. This application Oct. 8, 1985, Ser. No. 785,035

Int. Cl.[4] H01Q 3/26; H04B 7/00

U.S. Cl. 343—373 **2 Claims**



1. A multi-beam array antenna, adapted to form a plurality of n differently directed, collimated beams of radio frequency energy, each one of such beams being associated with a corresponding one of n system ports, comprising:

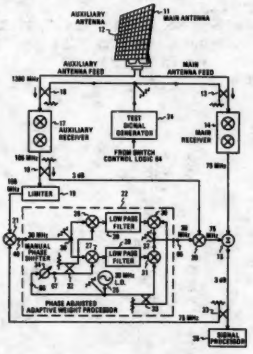
(a) an array of m antenna elements;
(b) a pair of substantially identical, electrically independent, radio frequency lenses, each one thereof having n beam ports and m array ports;
(c) a plurality of, n, first quadrature couplers, each one thereof having a first port coupled to a pair of substantially electrically isolated second ports;
(d) a plurality of, m, second quadrature couplers, each one thereof having a first port coupled to a corresponding one of the array of antenna elements and a pair of substantially electrically isolated second ports;
(e) means for coupling the n beam ports of a first one of the radio frequency lenses to first ones of the pair of second ports of the first quadrature couplers and for coupling the n beam ports of a second one of the pair of radio frequency lenses to second ones of the pair of second ports of the first quadrature couplers;
(f) means for coupling the m array ports of the first one of the radio frequency lenses to first ones of the pair of second ports of the second quadrature couplers and for coupling the m array ports of the second one of the pair of radio frequency lenses to second ones of the pair of second ports of the second quadrature couplers;
(g) wherein the electrical length from one point on the wavefront of one of the beams through one of the antenna elements and through the pair of radio frequency lenses to the one of the system ports associated with such one of the beams is equal to the electrical length from another point on said wavefront of said one of the beams through another one of the antenna elements and through the pair of radio frequency lenses to the same one of the system ports associated with such one of the beams; and,
(h) wherein the phase shift between a first one of the antenna elements and a second one of the antenna elements through a first one of the pair of radio frequency lenses differs by $n\pi$ (where n is an odd integer) from the phase shift between said first one of the antenna elemenis to said second one of the antenna elements through the second one of the pair of radio frequency lenses.

4,612,549

INTERFERENCE CANCELLER LOOP HAVING AUTOMATIC NULLING OF THE LOOP PHASE SHIFT FOR USE IN A RECEPTION SYSTEM

Bernard H. Geyer, Jr., Liverpool, and Donald W. Perkins, Dewitt, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 23, 1983, Ser. No. 565,110
Int. Cl.[4] G01S *3/16, 3/28*
U.S. Cl. 343—379 **5 Claims**



1. In a reception system having a main directional antenna and an auxiliary, less directional antenna, an interference cancellation phase coherent correlation cancellation loop, comprising:

A. means to generate an auxiliary test signal on a carrier as virtual interference for loop phase adjustment, said generating means having as On-Off control input and an output,
B. a cancellation summer having a first input, a second input and an output,
(1) means coupling the main return containing interference on a carrier in the operate state and the output of said test signal generating means in the alignment state to said first summer input,
(2) means coupling a weighted auxiliary signal containing interference on a carrier into operate state and the output of said signal generating means in the alignment state to said second summer input for interference cancellation,
(3) said summer output providing the main signal and an interference residue on a carrier,
C. a correlation mixer having a first input, a second input and an output,
(1) means coupling a part of said summer output containing said interference residue to said first mixer input,
(2) means coupling said auxiliary signal containing interference in the operate state and the output of said test signal generating means in the alignment state to said second mixer input, and
(3) said mixer output providing a first complex correlation vector modulated on a carrier and resulting from the correlation of the interference in said two mixer inputs for use as a complex weight for interference cancellation;
D. a phase adjusting adaptive weight processor, comprising:
(1) a stable oscillator having a frequency equal to said correlation carrier and producing two quadraturely related components,
(2) digitally adjustable phase shifting means comprising a pair of synchronous demodulators coupled to the output of said correlation mixer and to said stable oscillator to derive two quadrature related correlation vector coordinates at base band, digitally phase shifted by an angle θ,
(3) a first and a second modulator coupled to said stable oscillator to modulate said phase coupled correlation coordinates, respectively, on the first and second of two quadrature related components of a carrier, coherent with said correlation carrier, and
(4) a digital phase error control network coupled to said digitally adjustable phase shifting means for adjusting said angle θ, comprising
(i) means to decouple one correlation component (e.g. I) at base band in said adaptive weight processor prior to application to said first modulator in the alignment state, and substitute a reference value therefor,
(ii) means coupled to the input of said second modulator to derive an error quantity corresponding to the other correlation component (e.g. Q') at base band resulting from application of said reference value state after the correlation loop has stabilized in the alignment mode, said error quantity approaching zero at a correlation cancellation loop phase shift of approximately 180°, and
(iii) means responsive to said error quantity to digitally command phase shift of said base band correlation coordinates to the angle θ, at which said error quantity is nulled in the alignment state and said loop phase shift is set to approximately 180° in the alignment state for operation,
(5) means to combine the outputs of said modulators to form a second correlation vector, phase shifted by said angle θ in respect to said first correlation vector, and modulated on said carrier coherent with said correlation carrier,
E. a weighting multiplier having a first input, a second input, and an output,

(1) means coupling said carrier borne second correlation vector to said first multiplier input,

(2) means coupling said auxiliary signal containing interference in the operate state and the output of said test generating means in the alignment state to said second multiplier input, and

(3) means coupling the product formed in said multiplier to said second input of said cancellation summer to complete the correlation cancellation loop.

4,612,550

INVERTED CASSEGRAIN ANTENNA FOR MULTIPLE FUNCTION RADARS

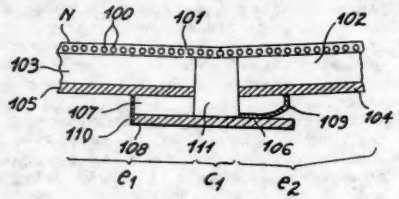
Jean-Michel Brucker, and Bernard Estang, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Mar. 31, 1983, Ser. No. 480,805

Claims priority, application France, Apr. 2, 1982, 82 05787

Int. Cl.[4] H01Q *19/195*

U.S. Cl. 343—756 **20 Claims**



1. A radar reflector, comprising:

a plurality of polarizer-reflector elements articulatable with respect to each other with a gap between adjacent elements, each element including a support layer having a first face and a second face which is covered by a reflective layer;

flexible sheet means for covering the first face of said support layer and straddling said gap; and

hinge means for providing articulation between said elements, said hinge means straddling said gap and including rigid reflecting means for reflecting radiation penetrating said gap, said rigid reflecting means having a first end in electrical contact with the reflective layer of one element and a second end in electrical contact with the reflective layer of an adjacent element.

4,612,551

ARRANGEMENT FOR THE OMNIDIRECTIONAL ORIENTATION OF AN ANTENNA

Claude Dreyer, Gelannes, France, assignor to S.I.C.A.R.T. (Societe Indusrielle de Construction d'Accessories Radio et Television, Nogent-sur-Seine, France

Filed Dec. 19, 1983, Ser. No. 563,078

Claims priority, application France, Dec. 20, 1982, 82 21308

Int. Cl.[4] H01Q *3/02*

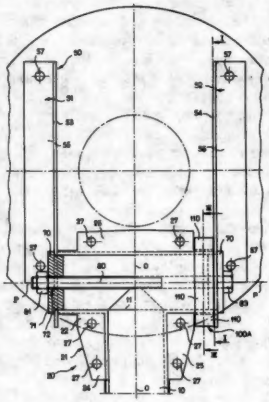
U.S. Cl. 343—765 **9 Claims**

1. An arrangement for the omnidirectional orientation of an antenna supported by a fixed mast, said arrangement comprising:

(a) a generally "T" shaped housing having a first arm and a second arm extending perpendicular to each other, said housing including two symmetrical half-shells, each half-shell having two wings, said two wings being in the form of hemi-cylindrical walls disposed perpendicular to each other, a first wing being joined in the middle of the second wing at a right angle in the form of a "T", and each of the half-shells having flat flanges in the vicinity of their straight edges, projecting outwards and resting against each other when the two half-shells are brought into contact with each other so that two first wings form said first arm of the housing and two second wings form a said second arm of the housing, said first arm being mounted on the fixed mast so that said first arm and the fixed mast compose two elements of a first articulation located around a first axis,

(b) an antenna support mounted on said second arm so that said second arm and said antenna support compose two elements of a second articulation located around a second axis which is perpendicular to said first axis,

(c) two identical adjustment assemblies, a first adjustment assembly which is associated with said first articulation



and a second adjustment assembly which is associated with the said second articulation, each adjustment assembly including a toothed ring integral with one of the elements of said articulations, and a worm engaged on said toothed ring and mounted immovably in translation on the other element of each articulation so that by action on one of the worms, the elements of the associated articulation are displaced relatively by rotation, thereby adjusting one of the elevation and the azimuth of the antenna, and

(d) first locking means and second locking means for locking each of the articulations in the adjusted position.

4,612,552

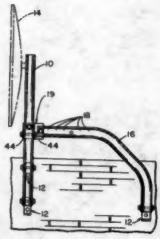
DISH ANTENNAE MOUNTING STRUCTURE

Lyle W. Hovland, Murrysville, and James D. Klingensmith, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 473,018, Mar. 7, 1983, Pat. No. 4,510,502. This application Dec. 17, 1984, Ser. No. 682,427

Int. Cl.[4] H01Q *1/22*

U.S. Cl. 343—880 **9 Claims**



1. A light weight mounting structure combination for dish antennae comprising:

an upright vertically extending mast for supporting said dish antennae, said mast having an upper end for attachment to said dish and a lower end for anchoring to a rigid-type structure;

a bent strut having a lower end for anchoring to a rigid-type structure and an upper end for attachment to said mast;

a second strut having a lower end for anchoring to a rigid-type structure and an upper end for attachment to said mast;

means for anchoring the lower ends of the mast, the bent strut and the second strut to the rigid-type structure, at least one of said lower ends being tubular, said means including for said lower tubular ends an anchor bracket, a threaded bolt having a shank portion for extending through said bracket and respective lower end, and a nut threaded on said bolt for drawing said anchor bracket and respective lower end tightly together, said bolt, nut, anchor bracket and respective lower end cooperating to indicate to one tightening the nut and bolt when a predetermined extent of tightness is attained, said predetermined extent of tightness being characterized by said lower tubular end having undergone a predetermined extent of deformation as evidenced by a visible out-of-roundness such that relative movement between the bracket and respective lower end is minimized;

means for attaching the upper ends of the bent strut and the second strut to the mast's midsection;

the anchoring and attaching means allowing the mounting structure to be mounted on vertically and horizontally extending rigid-type structures, and on structures disposed at all angles in between.

4,612,553

METHOD FOR OPERATIONAL STATUS CHECKS OF AN INK JET PRINTER

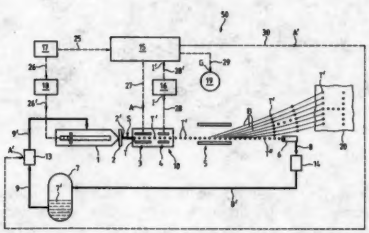
Franz Kohler, Meersburg, Fed. Rep. of Germany, assignor to Contraves GmbH, Haar/Munich, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,570

Claims priority, application Switzerland, Jan. 20, 1984, 251/84

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—1.1 **11 Claims**



1. A method of monitoring and regulating the ink droplet velocity in the ink supply system of an ink jet printer, comprising the steps of:

weakly electrostatically charging a first, relatively small, number of ink droplets during a non-writing and non-recording dead-time interval;

leaving a second, nearly twice as great, number of ink droplets uncharged during said dead-time interval; and

detecting a signal nearly proportional to the ink droplet velocity of said first, weakly charged ink droplets.

4,612,554

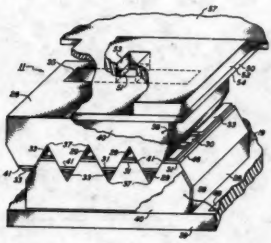
HIGH DENSITY THERMAL INK JET PRINTHEAD

Michael Polesbuk, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1985, Ser. No. 760,009

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**



1. An ink jet printhead for a drop-on-demand thermal ink jet printer, the printhead being of the type having a plurality of parallel channels, each channel being supplied with ink and having one open end which serves as an ink droplet ejecting nozzle, a heating element being positioned in each channel a predetermined distance from the nozzle, ink droplets being ejected from the nozzles by the selective application of current pulses to the heating elements in response to digitized data signals received by the printer, the heating elements transferring thermal energy to the ink in contact therewith causing the formation and collapse of temporary vapor bubbles that expel the ink droplets, said printhead comprising:

at least two substantially identical parts, the parts having first and second planar surfaces which are mutually perpendicular to parallel opposing edge faces, the first surface of each part containing a linear array of equally spaced heating elements, each heating element having opposing sides and being located a fixed distance from a one of the part edge faces, addressing electrodes connecting one side of the heating element to a common return and the other side to an electrode terminal, the addressing electrodes being parallel to each other and perpendicular to the part edge faces, a groove with a V-shaped, cross-sectional area between each heating element and its associated addressing electrode being parallel to each other and the addressing electrode, the grooves extending substantially across the part first surface, and penetrating the edge faces, the two parts being fixedly mated together with their first surfaces engagingly meshed together, so that their respective heating elements and associated addressing electrodes reside in the grooves of the other part, the grooves of the engaged parts forming channels around the heating elements and the open ends of the channels near the heating elements serve as the nozzles, the opposite open channel ends being closed and each channel having means for communication with each other near their closed ends;

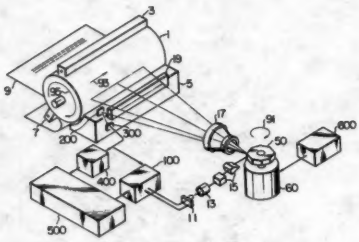
means for supplying ink to the channels; and

means for selectively applying current pulses to the addressing electrode terminals and for grounding the common return.

4,612,555
LASER BEAM SCANNER APPARATUS

Jinichi Hongou; Yoshifumi Homma, both of Hitachi; Shoichi Ito, Ibaraki, and Kimio Tatsuno, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,891
Claims priority, application Japan, Jul. 8, 1983, 58-123374
Int. Cl.[4] G01D *15/14, 9/42;* H04N *1/21*
U.S. Cl. 346—160 23 Claims



1. A laser beam scanner apparatus comprising:
a laser light source;
a deflector for deflecting a laser beam output from said laser light source;
an imaging optical system for forming a laser beam spot on a scanning surface; and
a current control circuit for controlling a drive current fed to said laser light source to control the light output, said current control circuit comprising a drive current control circuit, said drive current control circuit controlling, on the basis of the incident angle of the laser beam with respect to said deflector, the drive current fed to said laser light source in order to compensate the light quantity of the deflected beam which varies with a change in incident angle of the laser beam with respect to said deflector.

4,612,556
SELF-CONTAINED PRESSURE SENSITIVE COPYING MATERIAL AND ITS PRODUCTION

Peter Pinot de Moira, High Wycombe, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Filed Oct. 5, 1984, Ser. No. 658,365
Claims priority, application United Kingdom, Oct. 7, 1983, 8326902
Int. Cl.[4] B41L *1/20;* B41M *3/12*
U.S. Cl. 346—215 5 Claims

1. A method for producing a self-contained pressure sensitive copying material comprising the steps of coating a sheet material with a coating composition comprising a colour developer material, a formaldehyde-containing suspension of microcapsules containing a colour former solution and a compound having a β-dicarbonyl group selected from the group consisting of malonic acid, acetylacetone, malonamide and diethyl malonate or a cyclic ketone which is added to the suspension of microcapsules in an amount effective to remove free formaldehyde from the suspension.

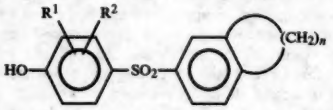
5. A self-contained pressure sensitive copying material produced by a method as claimed in claim 1.

4,612,557
HYDROXYDIPHENYL SULFONE DERIVATIVE AND HEAT-SENSITIVE RECORDING MATERIAL USING THE DERIVATIVE

Fumio Hama, Osaka; Toshitake Suzuki, Kobe, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co. Ltd., Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,750
Claims priority, application Japan, Nov. 30, 1984, 59-254758
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—216 2 Claims

1. In a heat-sensitive recording material incorporating a colorless or pale-colored basic dye and a color acceptor which is reactive with the dye to form a color when contacted therewith, the recording material characterized in that the color acceptor comprises at least one hydroxydiphenyl sulfone derivative represented by the formula [I]



[I]

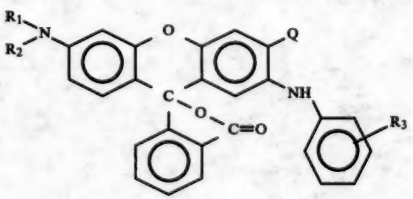
wherein R^1 and R^2 are each hydrogen, halogen, lower alkyl, lower alkoxy or hydroxyl and n is an integer of 3 or 4.

4,612,558
FLUORAN COMPOUNDS

Mitsutoshi Anzai, Tokyo; Masahiko Yamaguchi, Matsudo; Kazuyuki Wakasugi, Yokohama; Susumu Suzuka, Yono; Michihiro Gonda, Kitamoto; Toshiyuki Abe, Tokyo; Katsumasa Kikkawa, Tokyo, and Mikiko Kanasugi, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

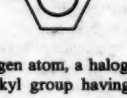
Filed Mar. 12, 1985, Ser. No. 710,991
Claims priority, application Japan, Mar. 24, 1984, 59-55285; Apr. 3, 1984, 59-65095; Apr. 3, 1984, 59-65096
Int. Cl.[4] B41M *5/18;* C07D *311/96*
U.S. Cl. 346—221 5 Claims

1. A fluoran compound having the formula:

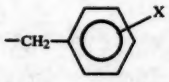


(I)

wherein each of R_1 and R_2 is a hydrogen atom, a straight chain or branched alkyl group having from 1 to 8 carbon atoms, a cyclohexyl group, a substituted or unsubstituted phenyl group, or a substituted or unsubstituted benzyl group, Q is either

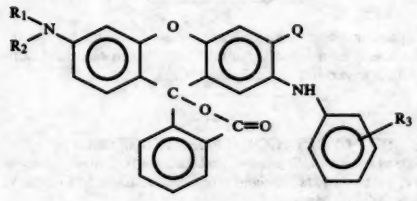


wherein X is a hydrogen atom, a halogen atom, or a straight chain or branched alkyl group having from 1 to 8 carbon atoms,



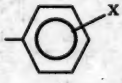
wherein X is as defined above, or $-(CH_2)_nOR_4$ wherein R_4 is a straight chain or branched alkyl group having from 1 to 8 carbon atoms, a cycloalkyl group, a substituted or unsubstituted phenyl group, or a substituted or unsubstituted benzyl group, and n is an integer of from 1 to 8, and R_3 is a hydrogen atom, a halogen atom, a lower fluoroalkyl group, an acyl group, an alkoxy group, an alkoxyalkyl group, or a straight chain or branched alkyl group having from 1 to 8 carbon atoms.

5. A heat sensitive record sheet which comprises a coated layer comprising a fluoran compound having the formula:

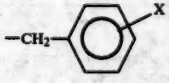


(I)

wherein each of R_1 and R_2 is a hydrogen atom, a straight chain or branched alkyl group having from 1 to 8 carbon atoms, a cyclohexyl group, a substituted or unsubstituted phenyl group, or a substituted or unsubstituted benzyl group, Q is



wherein X is a hydrogen atom, a halogen atom, or a straight chain or branched alkyl group having from 1 to 8 carbon atoms,



wherein X is as defined above, or $-(CH_2)_nOR_4$ wherein R_4 is a straight chain or branched alkyl group having from 1 to 8 carbon atoms, a cycloalkyl group, a substituted or unsubstituted phenyl group, or a substituted or unsubstituted benzyl group, and n is an integer of from 1 to 8, and R_3 is a hydrogen atom, a halogen atom, a lower fluoroalkyl group, an acyl group, an alkoxy group, an alkoxyalkyl group, or a straight chain or branched alkyl group having from 1 to 8 carbon atoms.

4,612,559

SOLAR CELL OF AMORPHOUS SILICON

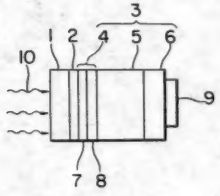
Hajime Hitotsuyanagi; Tadashi Igarashi; Masayuki Ishii, and Tadakazu Kobayashi, all of Itami, Japan, assignors to Director General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,702

Claims priority, application Japan, Mar. 8, 1983, 58-36751; Mar. 8, 1983, 58-36752

Int. Cl.[4] H01L *45/00*

U.S. Cl. 357—2 **11 Claims**



1. In a solar cell of amorphous silicon having a PIN structure, wherein the solar radiation is allowed to enter from the P type layer, the improvement comprising the P type layer which consists of laminated layers of a P_1 layer and a P_2 layer, the P_1 layer having a larger electrical conductivity and a lower concentration of carbon or nitrogen than the P_2 layer.

4,612,560

FIELD EFFECT TRANSISTOR OPERATING IN THE ENHANCEMENT MODE

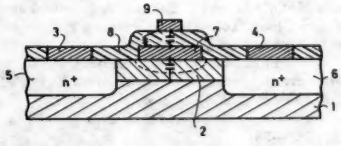
Jean-Marc Dortu, Paris, and Erhard Kohn, Orsay, both of France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1984, Ser. No. 607,503

Claims priority, application France, May 10, 1983, 83 07792

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **8 Claims**



1. A field effect transistor for operating in the enhancement mode comprising;

a semi-insulating material substrate;

at least one semiconductor active layer supported by said semi-insulating material substrate, a source electrode and a drain electrode both formed on the active layer and having a gate control electrode which has a capacitive structure comprising;

a first metal coating deposited on the active layer and forming a Schottky junction therewith,

a nonstoichiometric dielectric layer deposited on the first metal coating, said layer having a controlled electric leak, a second metal coating, deposited on the dielectric layer, forming the control gate,

means for supplying a control gate bias voltage to said second metal coating.

4,612,561
PARALLEL-CONNECTED GATE TURN-OFF THYRISTORS

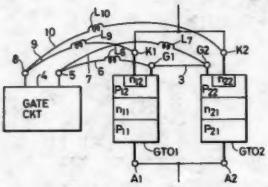
Shin Kimura; Hiroshi Fukui, both of Hitachi; Shinji Yamada, Ichihara; Shuji Musha, and Masayoshi Sato, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,727

Claims priority, application Japan, Jun. 25, 1982, 57-110339

Int. Cl.⁴ H01L *29/74;* **H03K** *17/60;* **G01R** *00/00;* **H02M** *00/00*

U.S. Cl. 357—38 **3 Claims**



1. A parallel connected gate turn-off thyristor device comprising:

a plurality of gate turn-off thyristors connected in parallel;

a common gate circuit connected between the gate and cathode terminals of said respective gate turn-off thyristors for supplying turn-on and turn-off gate currents to said respective gate turn-off thyristors; and

a short circuiting means for short circuiting at least either the respective gate terminals or the respective cathode terminals of said respective gate turn-off thyristors, whereby the turn-on and turn-off gate currents supplied from said common gate circuit to one gate turn-off thyristor which has turned on or turned off earlier is transferred through said short circuiting means to other gate turn-off thyristors which are not yet turned on or turned off so that the turn-on and the turn-off gate currents to the other gate turn-off thyristors are increased and the turn-on and turn-off operations of the other gate turn-off thyristors are hastened.

4,612,562
PNPN SWITCH DEVICE WITH CAPACITOR FORMED OUTSIDE ACTIVE DEVICE AREAS

Hideaki Motojima; Hiroki Takayama, both of Yokohama, and Jun-ichi Ohura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,148

Claims priority, application Japan, Jun. 5, 1984, 59-114909; Dec. 26, 1984, 59-273261

Int. Cl.⁴ H01L *29/74*

U.S. Cl. 357—38 **7 Claims**

1. A PNPN switch device comprising:

a first N-type region;

a first P-type region formed in the surface region of said first N-type region;

a second P-type region formed in the surface region of said first N-type region and set apart from said first P-type region;

a second N-type region formed in the surface region of said second P-type region to be used as a cathode;

a third N-type region formed in the surface region of said second P-type region and set apart from said second N-type region;

an insulation layer formed on said second P-type region;

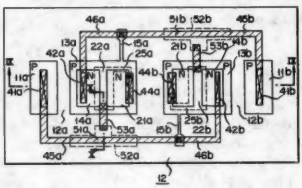
a first conductor layer formed on said insulation layer and extending over said second N-type region and said third N-type region;

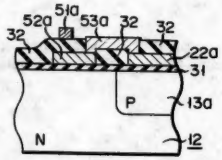
a first electrode short-circuiting said second P-type region and said third N-type region;

a second electrode formed on said first P-type region;

a third electrode formed on said second N-type region;

a resistor formed on said insulation layer and connected at one end to said first conductor layer and at the other end to said first electrode; and





a capacitor element formed outside said second P-type region and equivalently connected between said first conductor layer and second electrode.

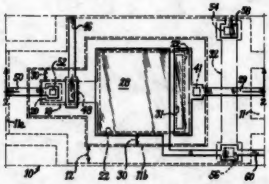
4,612,563
HIGH VOLTAGE INTEGRATED CIRCUIT

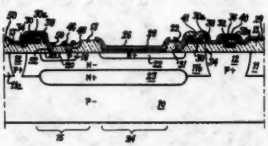
John D. Macdougall, Westboro, and Richard B. Cooper, Shrewsbury, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 30, 1984, Ser. No. 635,878

Int. Cl.⁴ H01L *27/02, 29/34*

U.S. Cl. 357—40 **11 Claims**





1. A high voltage integrated circuit comprising

a silicon crystal substrate of P-type,

an epitaxial layer of N-type having been grown over a surface of said substrate,

an annular P-type isolation wall extending through said epitaxial layer and enclosing a pocket of said epitaxial layer therein,

a mildly doped P-typed region in a surface portion of said pocket that may serve as a part of an electronic component formed in said-pocket,

a first silicon dioxide layer over said epitaxial layer,

a high resistivity doped polysilicon field plate in the form of

a strip over said pocket on a first surface portion of said first silicon dioxide layer, said field plate strip encircling said component and being positioned just inside the portion of said isolation wall which defines said pocket,

a high resistivity doped polysilicon resistor body in the form of a strip on a second surface portion of said first polysilicon dioxide layer, the dopant profile in and the sheet resistivity of said field plate being identical to that of said resistor,

a second silicon dioxide layer over said polysilicon field plate and resistor,

a silicon nitride layer over said second silicon dioxide layer to provide a dual second-silicon-dioxide/silicon-nitride insulation over said field plate and said resistor,

a metal film conductor contacting a portion of said P-type region through a hole provided in said first silicon dioxide layer, said metal conductor extending from said P-type region outward and over one area of said dual insulation of said polysilicon field plate,

another metal conductor contacting said N-type epitaxial pocket through a hole provided therefor in said first silicon dioxide layer and contacting said field plate through a hole provided therefor in another area of said dual insulation.

4,612,564

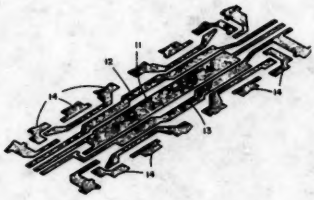
PLASTIC INTEGRATED CIRCUIT PACKAGE

Harold W. Moyer, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 4, 1984, Ser. No. 616,823

Int. Cl.⁴ H01L *23/40, 23/12*

U.S. Cl. 357—70 **8 Claims**



1. Device comprising;

a lead frame including a plurality of metal bonding sites formed in a configuration having an interior portion and a plurality of electrical conductor members extending outwardly from said plurality of bonding sites,

a central chip support region in the interior portion of the bonding site configuration, said chip support region comprising:

a chip support paddle,

at least one conductive crossunder member having two ends and extending alongside the chip support paddle,

a semiconductor chip having at least two opposing edges, said chip electrically contacting said chip support paddle and overlying substantially the said crossunder member so that said crossunder member extends from at least one edge of the chip to the other edge of the chip,

insulating means between the chip and crossunder members, and

at least one conductive wire bond extending from said chip to said crossunder member.

4,612,565

SEMICONDUCTOR MEMORY DEVICE

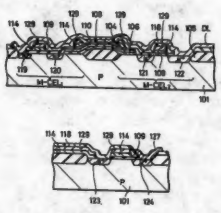
Shinji Shimizu, Houya, and Hiroyuki Miyazawa, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 375,697, May 6, 1982. This application Oct. 3, 1985, Ser. No. 783,531

Claims priority, application Japan, May 27, 1981, 56-79210

Int. Cl.⁴ H01L *29/46, 29/54, 29/62*

U.S. Cl. 357—71 **15 Claims**



1. In a semiconductor memory device including a memory cell array in which a plurality of memory cells each having a capacitor and an insulated gate type field effect transistor that are formed at a single semiconductor body are arrayed in rows and columns, said memory cell array including a data line in electrical connection with the source or drain regions of the insulated gate type field effect transistors of the memory cells arrayed in a respective row of said memory cell array, said data line being positioned to extend on the capacitors of the memory cells of the respective row of said memory array, and peripheral circuitry which is disposed in association with said memory cell array and which is constructed of insulated gate type field effect transistors formed at said semiconductor body; the improvement therein comprising:

that one electrode of each of the capacitors consists essentially of a single first layer of polycrystalline silicon which is formed on an insulating film formed on said semiconductor body; and

that a gate electrode of each of the insulated gate type field effect transistors of said memory cells and said peripheral circuitry is made of a second layer of multilayer structure which is formed on an insulating film formed on said semiconductor body, and which comprises a lower layer of polycrystalline silicon and an upper layer of refractory metal silicide.

4,612,566

MICROWAVE TRANSISTOR MOUNTING STRUCTURE

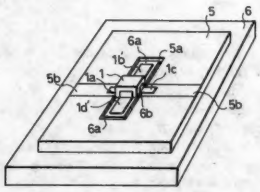
Masakatsu Kowata, and Torao Hiyama, both of Haramachi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 26, 1984, Ser. No. 674,591

Claims priority, application Japan, Nov. 30, 1983, 58-183774[U]

Int. Cl.⁴ H01L *23/48*

U.S. Cl. 357—80 **2 Claims**



1. A microwave transistor mounting structure for mounting

a microwave transistor and grounding a pair of terminals thereof having short lengths extending linearly in opposite directions on either side of a width of the transistor, and for connecting other leads thereof to other elements, comprising:

a chassis plate formed to have a pair of upwardly projected grounding portions having top surfaces projected a selected height above said chassis plate and being spaced apart by a distance substantially equal to said width of said transistor;

an insulator substrate sheet mounted on said chassis plate having a thickness substantially equal to said height of said projected grounding portions and provided with a hole through which said pair of projected grounding portions project, so that said pair of grounding terminals of said microwave transistors can each be mounted on and electrically connected to the top surface of a respective one of said projected grounding portions;

wherein said grounding terminals can be grounded by only said short lengths extending linearly from said transistor, and a gap of said projected portion height is maintained between said transistor and said chassis plate below; and

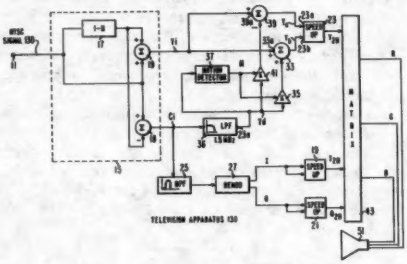
wherein said other leads of said microwave transistor can be mounted to other areas of the insulator substrate sheet and connected to other elements mounted thereon in proximity to said leads.

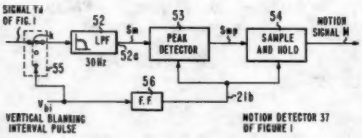
4,612,567

TELEVISION RECEIVER USING NON-INTERLACED SCANNING FORMAT WITH VERTICAL DETAIL ENHANCEMENT AND MOTION COMPENSATION

Dalton H. Pritchard, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 3, 1984, Ser. No. 607,121
Int. Cl.[4] H04N *9/78, 7/01*
U.S. Cl. 358—11 **17 Claims**





1. A television apparatus for processing a television signal that provides picture information suitable for display in a plurality of display lines comprising:

first filter means for filtering said television signal for producing a luminance component signal;

second filter means for filtering said television signal for producing a vertical detail representative signal;

motion detector means responsive to said television signal for producing a motion indicative signal; and

combining means responsive to said motion indicative signal for combining said vertical detail signal and said luminance signal to form a processed luminance output signal that contains a vertical detail component which varies inversely with motion in the picture.

8. A television apparatus for processing a television signal that provides picture information suitable for display in a plurality of display lines comprising:

means responsive to said television signal for producing a first signal that is representative of a first component signal;

means responsive to said television signal for producing a picture detail signal that is representative of picture detail;

means responsive to said television signal for producing a signal that is indicative of motion in the picture; and

means responsive to said motion indicative signal for proportionately combining in accordance with said motion indicative signal said picture detail signal and said first signal to form a second signal that contains enhanced picture detail of said first component signal in accordance with motion in the picture; and wherein

said combining means proportionately adds said picture detail and first signals in accordance with said motion indicative signal to form said second signal that contains enhanced picture detail of a first polarity; and

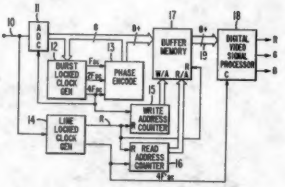
second combining means for proportionately subtracting said picture detail and first signals in accordance with said motion indicative signal to form a third signal that contains enhanced picture detail of the opposite polarity.

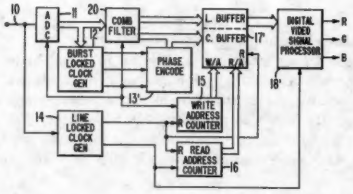
4,612,568

BURST-TO-LINE-LOCKED CLOCK DIGITAL VIDEO SIGNAL SAMPLE RATE CONVERSION APPARATUS

Willem den Hollander, Schlieren, and Werner N. Hartmeier, Geroldswil, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 5, 1984, Ser. No. 668,478
Int. Cl.[4] H04N *9/44, 9/64*
U.S. Cl. 358—19 **12 Claims**





5. A video signal processing system for processing composite video signal including a color component, said video signal in sampled data format and sampled synchronously with said color component at regularly recurring phases of said color component, comprising:

a source of sample clock signal which is synchronous with said video signal samples;

means coupled to said source of sample clock signal for providing sample clock digital codes corresponding to respective sampling phases of said video samples;

a source of processing clock signal having a frequency sub-

stantially equal to the frequency of said sample clock signal and asynchronous therewith;

memory means having an input port for applying said sample data video signal and said sample clock digital codes, for storing said video signal and respective associated digital codes synchronously with said sample clock signal, and for reading said stored video signal and associated digital codes synchronously with said processing clock signal, wherein said storing and reading operations occur concurrently.

4,612,569

VIDEO EDITING VIEWER

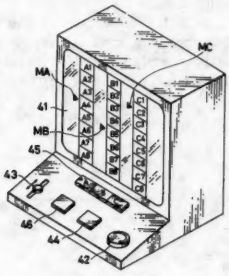
Izumi Ichinose, Tokyo, Japan, assignor to Asaka Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,231

Claims priority, application Japan, Jan. 24, 1983, 58-10427

Int. Cl.⁴ H04N *5/22, 5/782, 5/87*

U.S. Cl. 358—22 **13 Claims**



1. A viewer for video editing comprising:

a memory for storing a plurality of successive frames of a television signal;

a writing control circuit for controlling storage of the television signals supplied from a video signal source into the memory;

a reading control circuit for reading-out the plurality of successive frames of the television signal stored in the memory;

a reproduction mode control means for controlling a direction and a speed of writing-in and reading-out operations for the memory by means of said writing and reading control circuits;

a single monitor for simultaneously displaying the plurality of successive frames of the television signal read-out of the memory as a continuous frame picture array on a screen of the single monitor; and

a means for indicating any frame displayed on the screen as an editing point.

4,612,570

NOISE REDUCTION CIRCUIT FOR REDUCING NOISE IN A COLOR SIGNAL OF A COLOR VIDEO SIGNAL

Shintaro Nakagaki, Fujisawa, and Takashi Kuriyama, Tokyo, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 4, 1984, Ser. No. 596,552

Claims priority, application Japan, Apr. 7, 1983, 58-61296

Int. Cl.⁴ H04N *9/64*

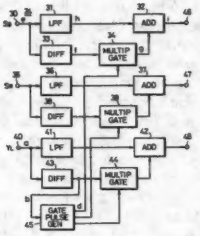
U.S. Cl. 358—36 **8 Claims**

1. A noise reduction circuit for a color video signal, said noise reduction circuit comprising:

gate pulse signal obtaining means for obtaining a gate pulse signal in accordance with a point in a luminance signal of a color video signal where a luminance change occurs;

high-frequency component obtaining means for obtaining a high-frequency component of a color signal of said color video signal, said high frequency component including a noise;

gating means for producing, as an output thereof during a time period corresponding to a gate pulse of the gate pulse signal, a signal from the high-frequency component obtained from said high-frequency component obtaining means;



frequency band limiting means for limiting the frequency band of said color signal so as to eliminate the high-frequency component thereof; and

color signal obtaining means for adding the output of said gating means and an output of said frequency band limiting means so as to produce as an output a color signal in which noise has been substantially eliminated.

4,612,571

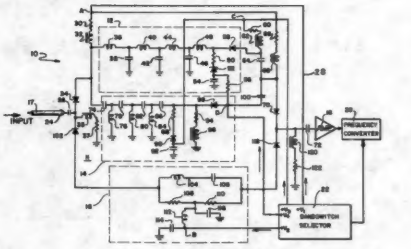
CONSTANT Z BANDSWITCHED INPUT FILTER

Frederick H. Moon, Mt. Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 7, 1984, Ser. No. 679,654

Int. Cl.⁴ H04N *7/10;* **H03H** *7/10*

U.S. Cl. 358—86 **9 Claims**



1. A constant impedance input filter for coupling channel frequencies received over a cable from an input terminal to an output terminal, comprising:

constant resistance low pass diplexer filter means operable for processing received channels within a low frequency band, said low pass filter means having a fixed upper cut-off frequency for passing only signals having a frequency below said fixed upper cut-off frequency and for directing to neutral ground potential signals having a frequency above said fixed upper cut-off frequency;

constant resistance high pass diplexer filter means operable for processing received channels within a high frequency band, said high pass filter means having a fixed lower cut-off frequency for passing only signals having a frequency above said fixed lower cut-off frequency and for directing to neutral ground potential signals having a frequency below said fixed lower cut-off frequency wherein said upper cut-off frequency is less than said

lower cut-off frequency so as to define a crossover frequency range therebetween;

constant resistance bridge T bandpass filter means operable for processing received channels within a band intermediate said upper and lower cut-off frequencies and within said crossover frequency range and for directing to neutral ground potential signals having a frequency below said upper cut-off frequency or above said lower cut-off frequency, wherein said high and low pass filter means and said bandpass filter means each have an input impedance equal to the characteristic impedance of the cable;

selector means responsive to a user input in selecting a channel for generating a bandswitch signal; and

switching means coupled to the input terminal, to said high and low pass filter means, to said bandpass filter means and to said selector means and responsive to a bandswitch signal from the selector means for selectively operataing either said high pass filter means, said low pass filter means or said bandpass filter means for coupling a received channel from said input terminal to said output terminal in accordance with a selected channel while providing a substantially constant impedance across the entire received signal bandwidth.

4,612,572

X-RAY TELEVISION DIAGNOSTIC APPARATUS

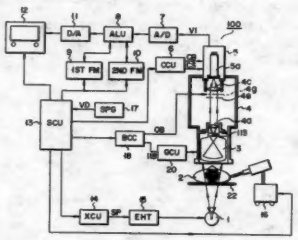
Kenichi Komatsu, Ootawara, and Michitaka Honda, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

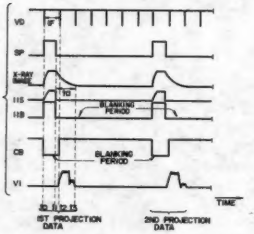
Filed Mar. 30, 1984, Ser. No. 595,440

Claims priority, application Japan, Mar. 31, 1983, 58-56407

Int. Cl.[4] H05G *1/64;* H04N *5/34*

U.S. Cl. 358—111 **7 Claims**





1. An X-ray television diagnostic apparatus for examining an object, comprising:

a source for generating pulsatory X-rays delivered to the object to produce pulsed X-ray images;

visible imaging means for receiving said pulsatory X-ray images and converting said X-ray images to corresponding optical images;

television means, including a television camera operating at a predetermined field rate and having a target that is scanned, for producing analog video signals representative of said optical images stored in said target;

synchronizing generating means for generating field synchronizing signals at the field rate of said television camera;

exposure control means responsive to said field synchronizing signals for generating X-ray control signals so as to cause said source to emit said pulsatory X-rays with a predetermined exposure time;

visible imaging control means for generating image blanking signals for said visible imaging means so as to cause said corresponding optical image to be delivered to said television means only during emission of said X-rays by said X-ray source;

television control means for generating field blanking signals relative to said X-ray control signals so as to cause said television means to be blanked out during emission of said X-rays by said X-ray source;

memory means for storing said analog video signals from said television means;

subtracting means for producing analog difference video signals corresponding to a subtraction between analog video signals recently supplied by said television means and analog video signals previously stored in said memory means; and

display means for producing visible difference video signals.

4,612,573

METHOD FOR CLOCK RATE CONVERSION

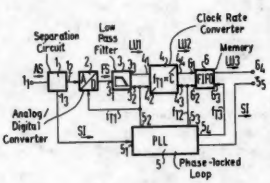
Hans-Joachim Grallert, Gröbenzell, and Alexander Starck, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,652

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333225

Int. Cl.[4] H04N *7/13, 7/01*

U.S. Cl. 358—140 **8 Claims**



1. A clock rate conversion method for first digitized television signals of television lines sampled at a first clock rate into second television signals having a predetermined processing clock rate, comprising the steps of:

generating clock signals having a first clock rate (f_{T1}), a second clock rate (f_{T2}) and, as the predetermined processing clock rate, a third clock rate (f_{T3}), where the second clock rate is related to the first clock rate by a rational number conversion factor (C) and is close to the third clock rate;

sampling the first digitized television signals at the first clock rate (f_{T1}) to obtain data words;

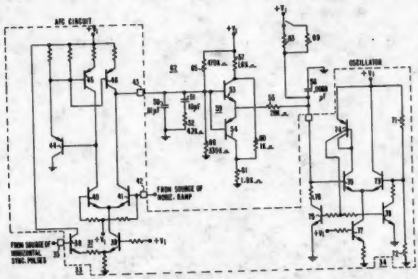
converting the data words to the second clock rate (f_{T2}) and storing the same; and

reading a plurality of data words ($K \pm m$) of K data words of each television line at the third clock rate (f_{T3}).

4,612,574
OSCILLATOR-FREQUENCY CONTROL INTERFACE CIRCUIT

Robert A. Barnes, Bainbridge, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 14, 1983, Ser. No. 542,311
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—158 8 Claims



1. A video display apparatus comprising:

a line deflection circuit providing retrace pulses and incorporating a line rate oscillator having a capacitor, the operating frequency of said oscillator determined by the charge and discharge rate of said capacitor;

a source of line rate synchronizing pulses;

frequency control means responsive to said retrace pulses and to said line rate synchronizing pulses for providing an output signal having an amplitude determined by the phase relationship between said retrace pulses and said line rate synchronizing pulses;

interface means comprising switch means having a first terminal coupled to said frequency control means output signal and a second terminal coupled to said capacitor of said line rate oscillator, said switch means also having a third terminal coupled to a source of voltage and a fourth terminal coupled to a source of reference potential, said switch means providing a first current path from said source of voltage potential to said capacitor for increasing the charging rate of said capacitor when the amplitude of said frequency control means output signal exceeds a first predetermined level, said switch means providing a second current path from said source of voltage potential to said source of reference potential for decreasing the charging rate of said capacitor when the amplitude of said frequency control means output signal is below a second predetermined level.

4,612,575
T.V. VIDEO IMAGE CORRECTION

Neal H. Ishman, Springfield, and William S. Alderson, Manassas, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

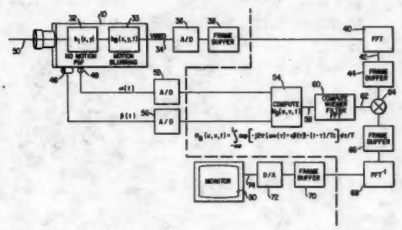
Filed Jul. 24, 1984, Ser. No. 633,923
Int. Cl.[4] H04N 5/14, 5/21
U.S. Cl. 358—160 28 Claims

1. A method for correcting a video image for motion induced blurring, comprising the steps of:

measuring the motion of a video camera and generating a motion signal,

generating a video camera signal from the video camera, the video camera signal including a blurring component,

computing a video deblurring signal from the motion signal, and

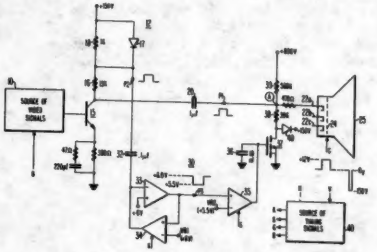


combining the video deblurring signal with the video camera signal to generate a motion corrected video signal.

4,612,576
AUTOMATIC KINESCOPE BIAS SYSTEM WITH AC COUPLED VIDEO OUTPUT STAGE

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 1, 1984, Ser. No. 656,369
Claims priority, application United Kingdom, Aug. 13, 1984, 8420537
Int. Cl.[4] H04N 5/16
U.S. Cl. 358—171 10 Claims



1. In a video signal processing system including an image display device for displaying video information in response to a video signal applied to an intensity control assembly thereof including an intensity control electrode, apparatus comprising:

a driver amplifier stage;

means for AC coupling video signals from an output of said driver amplifier;

a current path for coupling video signals from said AC coupling means to said intensity control assembly; and

bias control means coupled to said display device for automatically maintaining a desired bias condition for said display device, wherein said bias control means comprises

means for generating a signal with a magnitude representative of the magnitude of the black current conducted by said display device during image blanking intervals;

DC restoration means responsive to said representative signal for providing an output biasing signal related to the magnitude of said representative signal; and

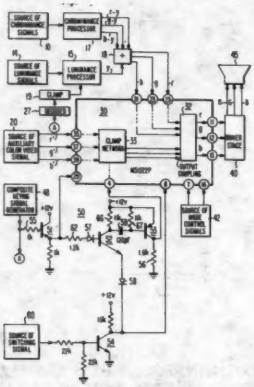
means for coupling said biasing signal to said intensity control assembly to maintain said desired bias condition.

4,612,577

VIDEO SIGNAL PROCESSOR WITH SELECTIVE CLAMP

Ronald T. Keen, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 26, 1985, Ser. No. 748,758
Int. Cl.[4] H04N 5/18
U.S. Cl. 358—172 12 Claims



1. A video signal processing system including an image display device, said system comprising:

a first input for receiving a first video signal having image and image blanking intervals;

a second input for receiving an auxiliary second video signal having image and image blanking intervals;

means for selectively coupling either said first video signal or said auxiliary video signal to said display device;

means for providing a first keying signal;

means responsive to said first keying signal for clamping said first video signal during blanking intervals thereof;

means for providing a second keying signal; and

means responsive to said second keying signal for clamping said auxiliary signal during blanking interval thereof; wherein

said second keying signal is displaced in time relative to said first keying signal.

4,612,578

IMAGER SYSTEM FOR NON-DESTRUCTIVE PROFILE READ-OUT

David Breithaupt, DeWitt, N.Y., assignor to General Electric Co., Charlottesville, Va.

Filed Apr. 4, 1985, Ser. No. 720,650
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—212 7 Claims

1. In a solid state imager having a matrix of individual picture elements arranged in rows and columns, each of the picture elements including a first and a second conductive plate, each of the first conductive plates in each row being connected to a common row electrode and each of the second conductive plates in each column being connected to a common column electrode, read out of the signal in any one picture element being effected by charge transfer between the first and the second conductive plates, a method for obtaining a profile of an object within a field of view of the imager comprising the steps of:

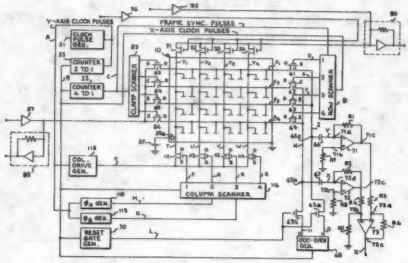
A. Selecting a first row for data readout;

B. setting a bias voltage on all rows other than the selected row to preclude charge transfer in such other rows;

C. setting a voltage on all column electrodes to create a potential well at each second conductive plate;

D. changing the bias voltage on the selected row such that charge under each first conductive plate in the selected row is transferred to the potential well created at the corresponding second conductive placte;

E. summing the charges appearing on the column electrodes resulting from the charge transfer to thereby obtain a



signal representative of the profile along the selected row; and

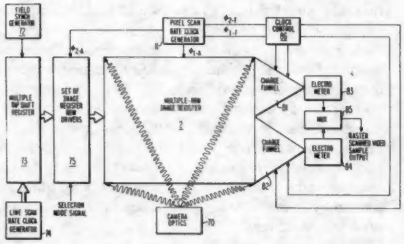
F. repeating steps A through E for each of the row electrodes whereby a profile is obtained along the axis of the rows.

4,612,579

TIME-DIVISION-MULTIPLEX CLOCKING OF MULTIPLE-CHARGE-TUNNEL CCD STRUCTURES, SUCH AS LINE-TRANSFER CCD IMAGERS

Harry G. Erhardt, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 3, 1985, Ser. No. 740,821
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 3 Claims



1. A charge-coupled-device time-division-multiplexer output stage comprising:

a plurality of charge funnels having respective input ends in alignment with each other and having respective output ends;

means for recurrently supplying to the input end of each said charge funnels a succession of charge packet trains, the time period during which each charge packet train is supplied defining a charge packet train interval;

means for applying forward clocking signals to each of said charge funnels for times substantially only so long as charge packet trains are supplied to its input end and for the next charge packet train interval thereafter; and

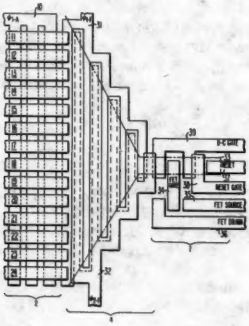
means, sensing the in-channel potential variations at the output ends of each of said charge funnels, for generating the output signal of said CCD time-division-multiplexer output stage.

4,612,580

TDM-INPUT ELECTROMETER, AS IN A LINE TRANSFER CCD IMAGER, USING A CHARGE FUNNEL

Paul K. Weimer, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 14, 1984, Ser. No. 650,615
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 13 Claims



1. A CCD imager of line transfer type constructed on a substrate of semiconductive material, said image comprising:

a plurality of parallelled charge transfer channels arranged with output ends in alignment in an image register, for receiving a radiant energy image projected thereinto;

a further charge transfer channel progressively narrowing from its input end to its output end, to provide a charge funnel, having an input end of sufficient width to span the aligned output ends of said parallelled charge transfer channels in said image register;

an electrometer stage with input connection at the output end of said charge funnel and with an output connection from which the output signal from said CCD imager is supplied responsive to charge level at the output end of said further charge transfer channel;

a plural-gate-electrode structure arranged over said plurality of parallelled charge transfer channels in said image register;

means applying clock signals to said plural-gate-electrode structure arranged over said plurality of parallelled charge transfer channels for successively clocking rows of charge packets into the input end of said charge funnel;

a plural-gate-electrode structure arranged over said charge funnel; and

means applying clock signals to said plural-gate-structure arranged over said charge funnel to transfer charge packets received at the input end of said charge funnel to its output end for sensing by said electrometer stage the in-channel potential levels associated with those transferred charge packets.

4,612,581

IMAGE SIGNAL REPRODUCTION CIRCUIT FOR SWING IMAGE SENSOR

Yukio Endo; Nozomu Harada, and Okio Yoshida, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

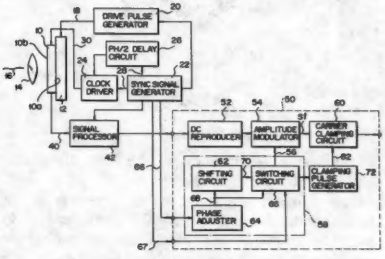
Filed Mar. 12, 1985, Ser. No. 711,022
Claims priority, application Japan, Apr. 13, 1984, 59-73959
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 6 Claims

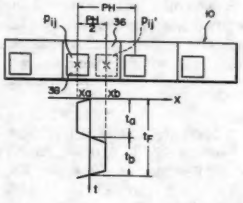
1. An image apparatus comprising:

(a) a solid state imaging device, which contains a solid state image sensor for periodically swinging in relation to incident light and in synchronism with one frame period, and for performing a swing image pickup operation while different sampling positions are changed between different field periods of one image frame, and which produces averaged first and second field image signals, said solid state image sensor having a pixel arrangement of a certain pitch;

(b) carrier generator means, for producing first and second carrier signals which have a frequency substantially the same as the read out frequency of the signal charges of said imaging device, and which have peaks corresponding to first and second sampling positions of said imaging device occurring in first and second field periods included in one frame period;

(c) modulator means for receiving said carrier signals, and for amplitude-modulating each carrier signal in accordance with the waveform of said averaged first and second field image signals supplied from said imaging device to thereby produce first and second amplitude-modulated field image signals, which are phase-shifted to each other by one half of the pixel pitch of the pixel arrangement of said imaging device, each of said first and second amplitude-modulated field image signals having peaks on the positive and negative sides; and





(d) signal processing means for adjusting said first and second amplitude-modulated field image signals such that the peaks of one polarity of their waveform match a reference potential level, whereby a one-frame image signal having greater resolution than that determined by only the actual numbers of said imaging device is obtained when said waveform-adjusted field image signals are synthesized.

4,612,582

LIQUID COOLED CATHODE RAY TUBE ASSEMBLY FOR VIDEO IMAGE PROJECTION SYSTEMS

Arthur R. Tucker, Titusville, Fla., assignor to Electronic Systems Products Inc., Titusville, Fla.

Filed Jul. 2, 1984, Ser. No. 627,034
Int. Cl.[4] H04N 5/74
U.S. Cl. 358—237 12 Claims

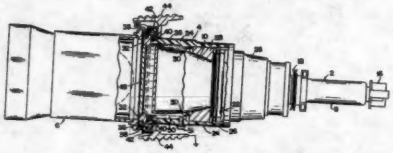
1. In video image projection system an improved cathode ray tube assembly comprising

a housing having an interior cavity defined by wall portions and having a window that is substantially transparent

optically for transmission of a projected video image therethrough;

projection cathode ray tube means mounted to said housing, said cathode ray tube means having a tube faceplate and bowl portion extending within said housing interior cavity, with said tube faceplate proximal said window;

fluid sealing means extending between a portion of the surface of said housing interior cavity and a rearward portion of said tube bowl distal said faceplate to form a fluid-tight seal between said housing interior cavity surface and said tube bowl rearward portion, whereby exists a forward cavity portion between said sealing means, the interior



cavity wall portions and said tube faceplate and forward bowl portion proximal thereto;

light transmissive heat transfer fluid which is at least partially conductive and electrically connected to ground, said heat transfer fluid being contained within said forward cavity portion and surrounding the exterior surface of said tube faceplate and forward bowl portion, whereby the fluid will transfer heat between the tube faceplate and the tube forward bowl portion; and

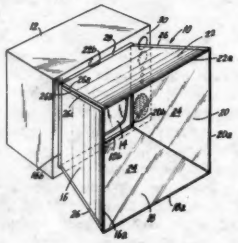
a conductive coating on the interior surface of said faceplate whereby the faceplate of the tube functions as a capacitor in response to the electrical charge imparted thereto by the electron gun of the tube.

4,612,583

IMAGE ENHANCING TELEVISION ATTACHMENT

Michael Ayervais, 235 E. 57th St., New York, N.Y. 10022

Filed Aug. 16, 1984, Ser. No. 641,455
Int. Cl.⁴ H04M *5/72*
U.S. Cl. 358—250 **4 Claims**



1. An image enhancing attachment for a television receiver having a viewing screen with a generally planar configuration comprising:

four reflective panels each shaped in the form of a trapezoid with a front edge and a rear edge parallel to each other, said front edge being longer than said rear edge, and with a pair of side edges extending between each of said front and rear edges;

hinge means attaching each of said reflective panels to two adjacent panels along said side edges thereof, said panels being attached so that in their assembled condition said front edges and said rear edges lie in respective common planes with said front edges and said rear edges arranged to form respective quadrilaterals;

means for releasably attaching said assembled panels to said television receiver with said rear edges lying at least in the immediate vicinity of the plane of said viewing screen and in general conformity with the outline thereof;

said assembled panels being arranged to have inner sides facing inwardly toward said viewing screen; and

reflective surface means extending entirely over each of said inner sides of each of said four panels each reflecting a clear image of said viewing screen;

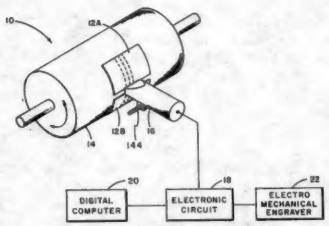
said four reflective panels each being dimensioned such that when mounted on a television receiver in said assembled condition an included angle between the plane of said viewing screen and said inner sides of each of said four panels is between 100° and 120°.

4,612,584

SCREEN GRAVURE ENGRAVING SYSTEM FOR ELECTROMECHANICAL ENGRAVERS

Harvey F. George, West Hempstead, and Yair Toor, Forest Hills, both of N.Y., assignors to Gravure Research Institute, Inc., Port Washington, N.Y.

Filed Oct. 31, 1984, Ser. No. 670,049
Int. Cl.⁴ H04N *1/40, 1/21, 1/23, 1/024*
U.S. Cl. 358—299 **19 Claims**



1. A method for converting halftone and screened film for use with electromechanical gravure engravers, comprising the steps of:

positioning an array of photosensitive elements adjacent at least one film having an image thereon in the form of transparent and opaque picture elements (pixels) having predetermined dimensions;

affecting relative movement between the array and the film for sampling a plurality of pixels of the film by the array;

assigning a predetermined number of photosensitive elements to a predetermined width of pixels;

effectively creating a first sample area bounded by the predetermined width of pixels and a pre-established number of samples;

effectively creating a second sample area smaller than the first sample area and bounded by a plurality of pixels, the center of the second sample area being coincident with that of the first sample area;

counting the photosensitive elements which provide signals indicating transparent pixel areas within the first sample area;

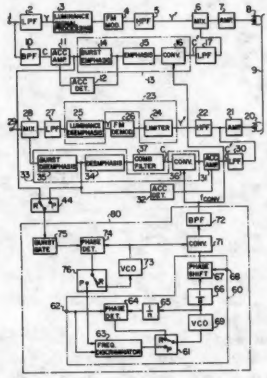
counting the photosensitive elements which provide signals indicating transparent pixel areas within the second sample area; and

adding the count of the photosensitive elements of the second sample area to the count of the photosensitive elements of the second sample area minus the count of the first sample area to provide a signal representing the percentage dot area (PDA) for use with an electromechanical gravure engraver.

4,612,585
CHROMINANCE SIGNAL RECORDING AND REPRODUCING APPARATUS

Osamu Takase, and Tomomitsu Kuroyanagi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,629
Claims priority, application Japan, Sep. 10, 1982, 57-156603; Sep. 13, 1982, 57-158101; Sep. 13, 1982, 57-158103; Jan. 28, 1983, 58-11558
Int. Cl.[4] H04N 5/76, 9/493
U.S. Cl. 358—316 19 Claims



1. A chrominance signal recording and reproducing apparatus for a video tape recorder in which a luminance signal modulated in frequency is mixed with a low-frequency converted chrominance signal to be recorded and reproduced, comprising:

emphasis means provided in a chrominance signal recording circuit chain for emphasizing side bands of said chrominance signal when said chrominance signal is at a low level; and

deemphasis means provided in a chrominance signal reproducing circuit chain and having characteristic reciprocal to that of said emphasis means for deemphasizing said chrominance signal.

4,612,586
METHOD FOR MEASURING TIMING ASYMMETRY IN A MAGNETIC STORAGE SYSTEM

Frank J. Sordello, Los Gatos, and Andrew M. Rose, Mt. View, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

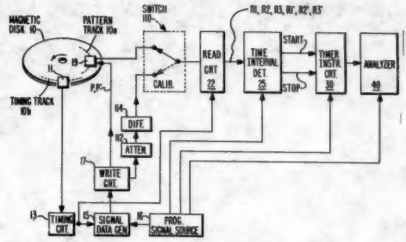
Filed Jun. 5, 1984, Ser. No. 617,431
Int. Cl.[4] G11B 27/36, 15/02, 5/09
U.S. Cl. 360—31 8 Claims

1. A method of measuring timing asymmetry in a magnetic storage system comprising the steps of:

providing manifestations along a track in a magnetic recording medium, each manifestation comprising a magnetic transition having either a negative-going or a positive-going direction, said manifestations being arranged such that a relatively large plurality of first and second substantially equal intervals are provided along said track, each first interval being formed by a beginning transition having a first direction and an ending transition having an opposite direction, and each second interval being formed by a beginning transition having said opposite direction and an ending transition having said first direction;

moving said medium and a head where asymmetry is to be measured relative to one another so that said head traverses the manifestations in said track and produces head output signals in response thereto;

detecting said head output signals produced by said head as said head and medium are relatively moved along said track; and

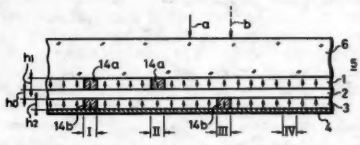


producing in response to said detecting an indication of timing asymmetry based on the jitter detected between said first and second intervals.

4,612,587
THERMOMAGNETIC RECORDING AND REPRODUCING SYSTEM

Masahiko Kaneko, and Hitoshi Tamada, both of Kawasaki, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00445, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02603, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 20, 1983, Ser. No. 643,976
Claims priority, application Japan, Dec. 23, 1982, 57-232433; Dec. 9, 1983, 58-233239
Int. Cl.[4] G11B 5/02, 5/09, 11/00, 11/10
U.S. Cl. 360—59 17 Claims

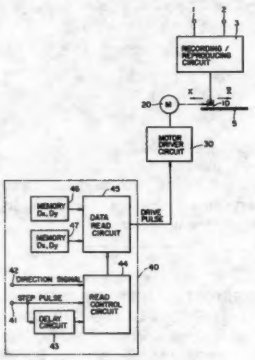


1. In a thermomagnetic recording system, a recording medium formed by laminating a first layer of soft magnetic material having an easy axis of magnetization normal to the layer surface, a transparent non-magnetic intermediate layer, a second layer of soft magnetic material having an easy axis of magnetization normal to the layer surface and a metal film or semi-metal film being adjacent to said second magnetized layer; a bias magnetic field is applied to said recording medium such that said first and second layers are magnetized to have a single magnetic domain over their whole surfaces and a magnetization directed to the direction perpendicular to the layer surfaces, and wherein a light pulse having a first wavelength is incident on said first magnetized layer to form a cylindrical magnetic domain magnetized in the direction opposite to the magnetization direction of the applied bias magnetic field thus recording an information bit in said first magnetized layer, and wherein a light pulse having a second wavelength which passes through said first and second magnetized layers is incident on said second magnetized layer to form a cylindrical magnetic domain magnetized in the direction opposite to the magnetization direction of the applied bias magnetic field thus recording an information bit in said second magnetized layer.

4,612,588
HEAD MOVING APPARATUS USING STEPPING MOTOR

Nobuhiko Tsukahara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,792
Claims priority, application Japan, Mar. 31, 1984, 59-64902; Apr. 2, 1984, 59-46691[U]
Int. Cl.[4] G11B *21/08;* H02K *29/04*
U.S. Cl. 360—78 **4 Claims**



1. A head moving apparatus using a stepping motor, in which in a recording/reproducing apparatus a signal conversion head is moved by a stepping motor from a first address position to a second address position corresponding to respective recording tracks formed on a recording medium, comprising:

(a) means for generating a signal indicative of the rotational direction or rotational angle of said stepping motor in relation to said first and second address positions;

(b) first memory means for storing therein at least one drive pattern for driving said stepping motor for moving said signal conversion head from said first address position to said second address position;

(c) second memory means for storing therein a second drive pattern for reciprocally driving said stepping motor in alternate forward and reverse directions when said signal conversion head has reached said second address position;

(d) means controlled by said means for generating said signal indicative of the rotational direction or rotational angle for reading said at least one and second drive patterns from said first and second memory means; and

(e) drive means for driving said stepping motor according to the drive patterns read out by said drive pattern reading means.

4,612,589
HEAD BASE DRIVE MECHANISM OF CASSETTE TAPE PLAYER

Ikuo Sakane, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,794
Claims priority, application Japan, Jun. 30, 1983, 58-116860
Int. Cl.[4] G11B *5/008, 15/00*
U.S. Cl. 360—90 **4 Claims**

1. A head base drive mechanism in a cassette tape player comprising

a chassis;

a head base slidable with respect to said chassis between a playback position and a stop position;

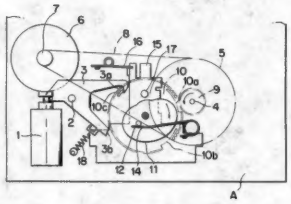
a capstan mounted to said chassis and having a capstan gear coaxially fixed thereon;

a cam gear having first and second notched sections therearound, said cam gear mounted to said chassis to come into mesh engagement with said capstan gear, said cam gear taking a first position when said first notched section faces the capstan gear and a second position when said second notched section faces the capstan gear;

a cam follower fixed upon said head base;

selective lock means for locking the cam gear at said first positon after releasing the same from the second position and for locking the cam gear at said second position after releasing the same from the first position;

first resilient means to urge said head base toward the stop position;



first cam means fixed on said cam gear to actuate said cam follower such that said head base is driven from the stop position to the playback position;

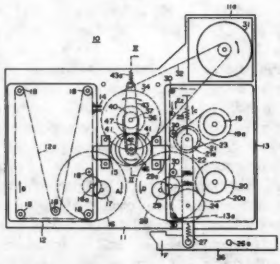
second resilient means to urge said first cam when said cam gear takes said first and second positons such that said cam gear comes into mesh engagement with the capstan gear for said capstan gear to drive the head base from the stop position to the playback position by way of said first cam and said cam follower against the first resilient means;and

second cam means fixed on said cam gear to actuate said cam follower such that said head base is driven from the playback position to the stop position.

4,612,590
TAPE DRIVE DEVICE FOR TELEPHONE ANSWERING DEVICE

Tsutomu Kurosawa, Menuma, Japan, assignor to Asahi Electronics Co., Ltd., Japan

Continuation of Ser. No. 386,663, Jun. 9, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 741,011
Claims priority, application Japan, Apr. 24, 1982, 57-59928[U]
Int. Cl.[4] G11B *5/008*
U.S. Cl. 360—91 **2 Claims**



1. A tape drive device for driving a multi-tape device comprising:

a base;

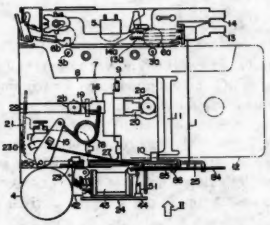
a first capstan flywheel rotatably mounted on said base and coupled to a capstan shaft for driving a first magnetic tape;
a second capstan flywheel also rotatably mounted on said base and coupled to a capstan shaft for driving a second, different magnetic tape in a direction of rotation opposite to that of said first capstan flywheel;
a single reversible motor means mounted on said base;
a power transmitting mechanism disposed substantially between said first and second flywheels and including a pivotally disposed idler pulley, interconnected with said motor means, which is displaced against said first flywheel and then, upon reversing the direction of rotation of said motor means, against said second flywheel to alternatively drive either said first tape or said second tape.

4,612,591

CASSETTE TAPE RECORDER WITH ROTARY ACTUATED EJECTION

Shinsaku Tanaka, Tokyo, and Toshio Yoshimura, Kawasaki, both of Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,262
Claims priority, application Japan, Apr. 26, 1984, 59-85045
Int. Cl.[4] G11B *5/008, 15/24*
U.S. Cl. 360—93 **4 Claims**



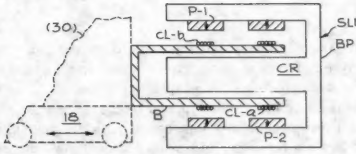
1. A cassette tape recorder comprising:
a cassette holder movable between a cassette loading position and a cassette releasing position;
a motor switch having first and second stationary contacts and a movable contact adapted to selectively touch the same and normally urged toward the first stationary contact side by a spring force;
a tape driving motor one pole of which is connected to one terminal of a power source through the first stationary contact and the movable contact of the motor switch, and the other pole of which is connected to the other terminal of the power source;
a changeover switch interposed between the second stationary contact of the motor switch and the one terminal of the power source, and adapted to be on when the cassette holder is in the cassette loading position and to be off when the cassette holder is in the cassette releasing position;
a solenoid connected in series with a normallyclosed ejection switch between the second stationary contact of the motor switch and the other terminal of the power source, and adapted to hold the movable contact of the motor switch on the second stationary contact side when excited;
an ejecting operation member for temporarily turning off the ejection switch;
a driving rotator normally rotated by the motor;
a driven rotator adapted to hold the movable contact of the motor switch on the second stationary contact side when located in a first pause position off the driving rotator, and to be rotated by the rotatory force of the driving rotator when engaged therewith;
an ejection mechanism actuated by the rotatory force of the driven rotator to move the cassette holder from the cassette loading position to the cassette releasing position; and
a rotation transmission control member adapted to normally hold the driven rotator in the first pause position off the driving rotator, to hold the driven rotator in a second pause position off the driving rotator immediately before the driven rotator engages the driving rotator after once releasing the driven rotator, urged by the solenoid, when the solenoid is excited, and to hold the driven rotator again in the first pause position after releasing the driven rotator again to cause the driven rotator to engage the driving rotator so that the ejection mechanism is actuated when the solenoid is deenergized.

4,612,592

DUAL COIL/DUAL MAGNET ACTUATOR

Jorgen Frandsen, Winnipeg, Canada, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 26, 1979, Ser. No. 106,721
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—106 **6 Claims**



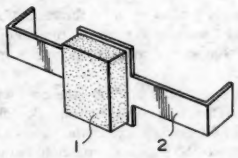
1. A "paired coil" actuator wherein at least one pair of like solenoid coil means is arranged on a reciprocatable support means so as to be controllably energized by current supply means and generate oppositely-directed electromagnetic fields and wherein magnet means is disposed operatively adjacent each such coil means and adapted to electromagnetically interact therewith to induce translation of the support means along a prescribed path.

4,612,593

TAPE PAD FOR USE IN MAGNETIC RECORDING TAPE CASSETTE

Kengo Oishi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation-in-part of Ser. No. 414,065, Sep. 2, 1982, abandoned. This application Dec. 10, 1982, Ser. No. 448,620
Claims priority, application Japan, Sep. 3, 1981, 56-131322
Int. Cl.[4] G11B *15/62*
U.S. Cl. 360—130.31 **1 Claim**

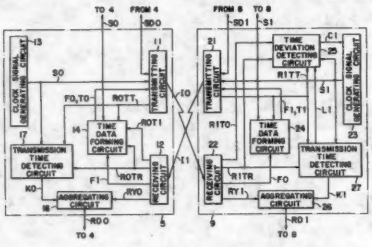


1. A tape pad for use in a magnetic recording tape cassettes for pressing a magnetic recording tape against a magnetic head of a tape recorder, the tape pad comprising a felt pad characterized in that at least the part of the felt pad brought into contact with the magnetic recording tape has an average density of 0.35 to 0.4 g/cm^3, an average diameter of fibers of 0.016 to 0.035 mm, an average length of fibers of 1.4 to 5.0 mm, and a surface roughness of 0.05 to 0.15 mm thereby improving the electromagnetic conversion characteristics of the magnetic recording tape.

4,612,594
PROTECTIVE RELAY SYSTEM AND SAMPLING SYNCHRONIZING METHOD THEREFOR

Mitsuru Yamaura, Hachioji, and Ituo Shuto, Fuchu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 10, 1984, Ser. No. 639,357
Claims priority, application Japan, Aug. 12, 1983, 58-147347
Int. Cl.[4] H02H 7/26
U.S. Cl. 361—68 13 Claims



1. A sampling synchronizing method for use in a protective relay system for an electric power system having two or more terminals at which electrical quantity is sampled, two of the terminals being coupled to form a pair, said sampling at each terminal being made in synchronism with a clock signal produced at each terminal, and electrical quantity data obtained by the sampling at each terminal of said pair is transmitted to the opposite terminal of said pair to be used for protection at said opposite terminal, the clock signals at the terminals of said pair having the same frequency.

wherein

synchronous signals **F0, F1,** are transmitted from each terminal of said pair toward the opposite terminal;

time data **T1** is transmitted from one terminal **SS2** of said pair toward the other terminal **SS1** of said pair, in association with the synchronous signal, the time data **T1** indicating a time point T_1 of the transmission of the synchronous signal **F1** toward said other terminal with reference to occurrence of the clock signal at said one terminal;

time data **T0** is transmitted from said other terminal toward said one terminal, in association with the synchronous signal **F0** in an M_0-th clock period (M_0 being a predetermined natural number) after the reception of the synchronous signal **F1** associated with the time data **T1** from said one terminal, the time data **T0** indicating a value given by:

$$t_0 - T1 + t_2$$

where t_0 represents a time point of the reception of the synchronous signal **F1** associated with the time data **T1** from said one terminal **SS2** with reference to occurrence of the clock signal at said other terminal **SS1**,

T1 represents a value indicated by the time data **T1**, and

t_2 represents a time point of said transmission of the synchronous signal **F0** associated with the time data **T0** toward said one terminal **SS2** with reference to occurrence of the clock signal at said other terminal **SS1**, and

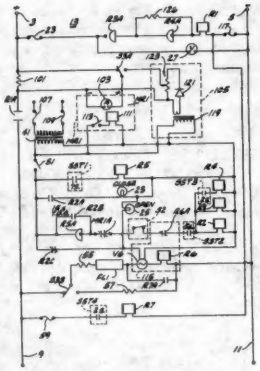
a time deviation **ΔT** in the occurrence of the clock signal between said pair of terminals is determined at said one terminal in accordance with the time data **T0** and a time point t_3 of the reception of the synchronous signal **F0** associated with the time data **T0** from said other terminal with reference to occurrence of the clock signal; and

the timing of the occurrence of the clock signal at said one terminal is adjusted in accordance with the time deviation **ΔT**.

4,612,595
DC POWER CONTROL SYSTEM

Ronald P. Gill, Nashville, and Vernon C. Evans, New Athens, both of Ill., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Jul. 9, 1984, Ser. No. 629,231
Int. Cl.[4] H02H 3/00, 7/00, 9/02
U.S. Cl. 361—93 15 Claims



1. In a direct current (DC) power system having conductors for carrying a DC current and means for tripping out said DC current, control apparatus comprising:

meter relay means coupled in shunt to one of said conductors for displayably measuring said DC current and comprising adjustable means for establishing an overcurrent limit and relaying when said limit is exceeded;

said means for tripping out said DC current responding to said relaying when said limit is exceeded;

adjustable DC relatively low power test source means; and

test switch means for switchably decoupling said meter relay means from said one conductor and connecting said meter relay means to said adjustable test source means, said test source means being sufficiently adjustable to cause said meter relay means to display both above and below said overcurrent limit;

whereby said control apparatus directly monitors said DC current in said one conductor and is testable by said test switch means with said adjustable test source means for tripping action at said overcurrent limit of said meter relay means.

4,612,596
CIRCUIT FOR STABILIZING ELECTROMAGNET COIL CURRENT OF A MAGNETIC RESONANCE IMAGING DEVICE

Timothy R. Fox, Chicago, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1985, Ser. No. 712,736
Int. Cl.[4] G01R 33/22; H01F 7/20
U.S. Cl. 361—146 4 Claims

1. A circuit for stabilizing the electromagnet coil current of a magnetic resonance imaging device, comprising:

a. a variable DC power supply having an output responsive to a control signal;

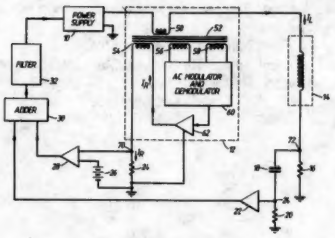
b. a DC current transformer, including a ferromagnetic core and a primary winding, for producing a first sample signal which is proportional to current passing through said primary winding;

c. a sense resistor;

d. means for passing current from said variable power supply in series through said primary winding, said electromag-

net coil of said magnetic resonance device, and said sense resistor;

e. means for obtaining a second sample signal which is proportional to change in the value of voltage developed across said sensing resistor; and



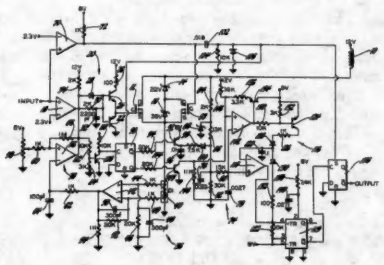
f. means, responsive to said first and second sample signals, for producing said current control signal for said variable DC power supply to provide a stable current to said electromagnet coil.

4,612,597

CIRCUIT FOR CONTROLLING AND INDICATING FUEL INJECTOR OPERATION

Glen C. Hamren, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1984, Ser. No. 683,342
Int. Cl.[4] H01H *47/32;* F02D *41/30*
U.S. Cl. 361—152 2 Claims



1. A circuit for controlling and indicating the operation of an electromagnetic fuel injector having a coil and an armature moved upon energization of the coil from a deenergized position to a stop position for controlling fuel injection, the circuit comprising in combination:

a voltage source,

a switching element series coupled with the coil across the voltage source, the switching element having a conductive state wherein the coil is charged by the voltage source and having a nonconductive state;

a high voltage breakdown device for providing a discharge path for the coil when the switching element is in its nonconductive state;

means responsive to an injection command signal and the value of the coil current for setting the switching element in its conductive state to charge the coil when the coil current is less than a first value and setting the switching element in its nonconductive state to discharge the coil when the coil current is greater than a second value greater than the first value, the time required for the coil current to first reach the second value in response to an injection command signal being less than the time for the armature to move from its deenergized position to its stop position;

means for monitoring the duty cycle of the conductive and nonconductive states of the switching element, the duty cycle varying in one direction while the core accelerates from its de-energized position to its energized position and in the opposite direction after the core reaches the stop position; and

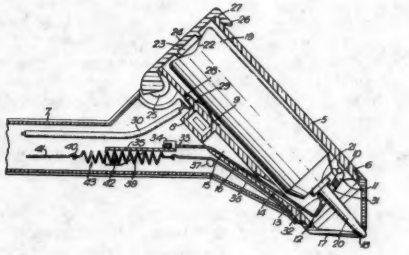
means for generating a signal that indicates operation of the fuel injector at the time at which the duty cycle variation changes its direction.

4,612,598

ELECTROSTATIC SPRAYING APPARATUS

Alan J. Norris, Cleveland, England, assignor to Imperial Chemical Industries, PLC, London, England

Filed Apr. 12, 1985, Ser. No. 722,388
Claims priority, application United Kingdom, Apr. 25, 1984, 8410520
Int. Cl.[4] B05B *5/02*
U.S. Cl. 361—227 9 Claims



1. Electrostatic spraying apparatus incorporating

(a) a sprayhead having

(i) a nozzle from which the liquid is to be sprayed,

(ii) liquid delivery means, incorporating a mechanically operable valve, for supplying liquid from a reservoir to the nozzle,

(iii) a valve-actuating member arranged such that linear movement of at least a portion thereof causes said valve to operate,

(iv) means for applying a high electric potential, relative to earth, to said nozzle,

(b) a manually operable lever remote from said sprayhead, and

(c) a mechanical connection between said lever and said valve-actuating member whereby movement of said lever causes the linear movement of said valve-actuating member to effect operation of the valve, said mechanical connection comprising a connecting member anchored at one end to a fixed part of the sprayhead and at the other end engaging with said lever, said connecting member including an elastically extensible portion and said valve-actuating member engaging with said connecting member at a position within said elastically extensible portion, and said connecting member being electrically conductive thus providing an electrical connection from said lever to said sprayhead.

4,612,599

CAPACITIVE PRESSURE SENSOR

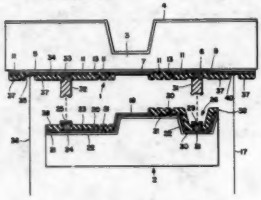
Karlheinz Ziegler, Alemannenstrasse 1, D-7801 Mengen-Schallstadt, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 683,268

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310643

Int. Cl.[4] H01G 7/00; H01L 29/84

U.S. Cl. 361—283 10 Claims



1. Capacitative pressure sensor of the semiconductor membrane type comprising:

a first semiconductor plate (1) having a center portion of a reduced thickness constituting a pressure-sensitive membrane for carrying the movable electrode of a measuring capacitor;

a second semiconductor plate (2) facing at least a portion of said first semiconductor plate which includes said center portion thereof and a portion surroundingly adjacent to said center portion, for carrying a counterelecrode of fixed position for said measuring capacitor;

a first insulating layer (5) applied to an area of the surface of said first semiconductor plate (1) facing said second semiconductor plate, which area includes the surface of said membrane;

a second insulating layer (22) applied to an area of the surface of said second semiconductor plate (2) facing said first semiconductor plate, which includes an area opposite said membrane;

an electrically conducting electrode layer (7) constituting said movable electrode and disposed on the portion of said first insulating layer applied to said membrane and thereby insulated from said first plate;

an electrically conducting counterelectrode layer (18) constituting said counterelectrode of fixed position and disposed on said second insulating layer (22) opposite said movable electrode and insulated from said second plate (2) by said second insulating layer (22);

electrically conducting connection paths (21, 29, 31, 6) disposed between said first and second plates while supported on one or the other thereof, at least some of said paths being insulated from the plate on which it is supported by one of said insulating layers,

said first and second semiconductor plates being connected at least mechanically together in respective portions thereof radially outward of said membrane with respect to an axis passing through the center of said membrane perpendicular thereto by features (25, 29, 31, 32) provided on said plates for maintaining at least a predetermined minimum spacing between said electrodes.

4,612,600

LOW FIRE CERAMIC COMPOSITIONS

Charles E. Hodgkins, Lewiston, N.Y., assignor to TAM Ceramics Inc., Niagara Falls, N.Y.

Filed Oct. 29, 1984, Ser. No. 665,917

Int. Cl.[4] H01G 4/10, 1/01; C04B 35/46

U.S. Cl. 361—321 9 Claims

8. A base metal/ceramic structure comprising:

a base metal layer cofired with a dielectric ceramic layer having an integument layer of base metal oxide disposed therebetween.

4,612,601

HEAT DISSIPATIVE INTEGRATED CIRCUIT CHIP PACKAGE

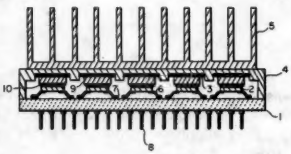
Toshihiko Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,425

Claims priority, application Japan, Nov. 30, 1983, 58-225801; Feb. 14, 1984, 59-24425; Jul. 30, 1984, 59-159832

Int. Cl.[4] H02B 1/00

U.S. Cl. 361—387 3 Claims



1. An integrated circuit chip package comprising:

a substrate;

a plurality of integrated circuit chips each being provided with a plurality of flexible beam leads on a body thereof and electrically and mechanically connected with said substrate via said beam leads;

a plurality of heat radiation plates each comprised of a good thermal conductor and rigidly joined with said integrated circuit chips in one-to-one correspondence by a first thermally conductive adhesive material;

a heat radiation cover comprised of a good thermal conductor covering a mounting surface of the chip substrate and held in contact with said heat radiation plates through a second thermally conductive adhesive material;

a heat sink rigidly mounted on said heat radiation cover; and

a plurality of terminals attached on a chip non-mounting surface of said substrate for input and output of signals to and from said chips and supplying a voltage from a power supply source to said chips.

4,612,602

FRONT PLATE MOUNTING GROUP FOR A PRINTED CIRCUIT BOARD

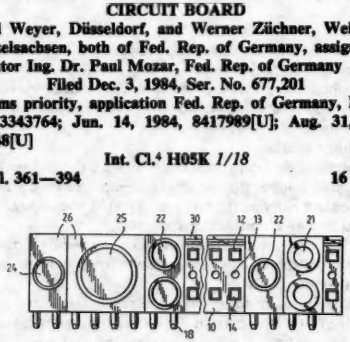
Erhard Weyer, Düsseldorf, and Werner Zöchner, Weinheim-Lützelsachsen, both of Fed. Rep. of Germany, assignors to Mentor Ing. Dr. Paul Mozar, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,201

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343764; Jun. 14, 1984, 8417989[U]; Aug. 31, 1984, 3432048[U]

Int. Cl.[4] H05K 1/18

U.S. Cl. 361—394 16 Claims



1. A front plate mounting group for use with a printed circuit board having connecting parts arranged in accordance with a first predetermined raster, said mounting group comprising an adapter for connection with said circuit board and a plurality of housings of standardized size and shape for releas-

able connection with said adapter and containing functional components, each of said housings having male prong-type housing contacts arranged according to a second predetermined raster, said adapter including a body with first and second faces and also including a plurality of connecting elements received by said body, said connecting elements of said adapter having first legs located adjacent said one face of said adapter body and arranged in accordance with said first predetermined raster for connecting cooperation with said connecting parts of said printed circuit board and having second ends provided with female contact elements located adjacent said second face of said adapter body and arranged in said second predetermined raster for releasable connecting engagement with said prong-type housing contacts of said housings, each of said connecting elements consisting in part of a first substantially straight leg extending from said first end of said connecting element to a point spaced from said first end and each of said connecting elements being squarely bent by substantially ninety degrees at said point so as to define a connecting element propping portion extending perpendicular to and adjacent said first leg, said body of said adapter having means defining for each of said connecting elements a propping surface engageable with said propping portion of said element to prop said first leg of said connecting element against movement relative to said adapter body under the force imposed on said first end of said connecting element as said adapter is moved relative to said printed circuit board so as to bring said first ends of said adapter connecting elements into connection with said connecting parts of said printed circuit board, said adapter body having a plurality of plug openings extending inwardly from said second face and arranged in said second raster for slidably receiving said second ends of said connecting elements, and said connecting elements and said adapter body being otherwise so formed that said connecting elements are insertable in said adapter body according to need.

4,612,603

METHOD OF MOUNTING AN APPLIANCE TO A BRACKET

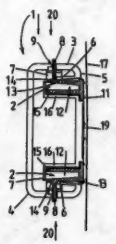
David L. Cook, P.O. Box 1367, Christchurch, New Zealand

Filed May 23, 1984, Ser. No. 613,503

Claims priority, application New Zealand, May 24, 1983, 204335

Int. Cl.[4] H05K 7/02, 7/04

U.S. Cl. 361—419 **15 Claims**



1. An assembly of an appliance and a bracket comprising:

a bracket including at least one male engaging member; and an appliance including

(i) a frame including at least one female recess for receiving the male engaging member,

(ii) a locking ledge connected to the frame and extending into the female recess to selectively engage the male engaging member and hold the appliance locked to the bracket,

(iii) a releasing member extending through an aperture in the frame to push the male engaging member away from the ledge and unlock the appliance from the bracket, and

(iv) spring means connecting the releasing member to the frame and biasing the releasing member away from the male engaging member.

8. An assembly of an appliance and a bracket comprising:

an appliance including at least one male engaging member; and

a bracket including

(i) a frame including at least one female recess for receiving the male engaging member,

(ii) a locking ledge connected to the frame and extending into the female recess to selectively engage the male engaging member and hold the appliance locked to the bracket,

(iii) a releasing member extending through an aperture in the frame to push the male engaging member away from the ledge and unlock the appliance from the bracket, and

(iv) spring means connecting the releasing member to the frame and biasing the releasing member away from the male engaging member.

4,612,604

PROJECTOR FOR PRODUCING A LIGHT SPOT OF POLARIZED LIGHT FOR BIOSTIMULATION PURPOSES

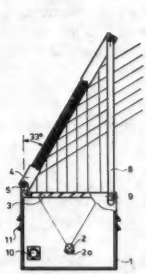
Yngve S. G. Schlyter, Malmoe, Sweden, assignor to Bildsystem AB, Malmo, Sweden

Filed Dec. 18, 1984, Ser. No. 683,007

Claims priority, application Sweden, Dec. 23, 1983, 8307157

Int. Cl.[4] F21V 9/14

U.S. Cl. 362—19 **16 Claims**



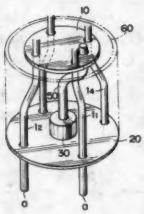
1. A projector for producing a light spot of polarised light for biostimulation purposes comprising: a lamp, a reflector associated with and arranged behind the lamp for reflecting the light beams in a forward direction and a Brewster polariser arranged in the beam path of the lamp, said reflector arranged behind said lamp to provide diverging forward beams, said lamp is a halogen lamp having a power in the range of several hundred watts, with a Fresnel lens inserted in the path between the Brewster polariser and the lamp so that the lamp lies substantially in the focal zone of the Fresnel lens, whereby the diverging forward beams of the lamp form a bundle of parallel beams impinging the Brewster polariser, in which the cross-sectional area of the reflected parallel polarised light bundle is on the order of some hundreds of cm^2 and is reflected at an angle with respect to said forward beams, a rectangular housing surrounding and locating the lamp, said housing defines an opening in the top wall, and said Fresnel lens is attached to said housing to cover the opening, said Brewster polariser including a number of spaced parallel glass plates fixed in a rectangular frame, said frame hingedly connected to a rear upper edge portion of said housing, said frame including supporting rods pivoted at their upper ends to said frame and being releasably engageable with said housing, said rods having a length which ensures that the angular position of said plates relative to said parallel beams corresponds to the Brewster angle.

4,612,605

LIGHT SOURCE DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,237
Claims priority, application Japan, Jan. 31, 1984, 59-16276
Int. Cl.[4] F21V 8/00; G02B 6/00
U.S. Cl. 362—32 15 Claims



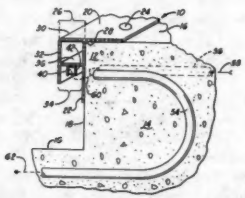
1. A light source device comprising optical conductor means through which light energy is transmitted, a first base plate, first hole means in said first base plate, said optical conductor means passing through said first hole means, a second base mounted adjacent to said first base plate, said second base plate having second hole means, said optical conductor means passing through said second hole means, said second base plate having a first and a second side, said first side facing said first base plate, said conductor means having end tip portions for emitting light which has been conducted by said conductor cable, said end tip portions extending from said second side of said second base plate, and motor means mounted on one of said base plates for effecting relative rotation between said first and second base plates.

4,612,606

APPARATUS FOR INDIRECT LIGHTING OF STAIRS

James R. Roberts, 4501 N. Western, Oklahoma City, Okla. 73118

Filed Apr. 1, 1985, Ser. No. 718,435
Int. Cl.[4] F21S 1/02
U.S. Cl. 362—146 20 Claims



1. Apparatus for use in indirect lighting of step treads, comprising:

first plate means for secure placement on at least the forward part of a step tread portion and extending a further forward edge beyond the step riser portion by a predetermined distance;

second plate means connected to said first plate means to extend for placement against the step riser portion immediately beneath said first plate means; and

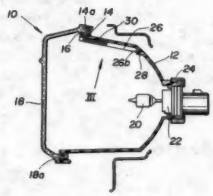
overhang plate means connected to extend from said first plate means forward edge parallel to said second plate means thereby to define a channel that is open in the direction generally parallel to said step riser.

4,612,607

AUTOMOTIVE LAMP UNIT

Toru Segoshi, Yokohama, and Masakazu Mutoh, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokahama, Japan

Filed Jun. 17, 1985, Ser. No. 745,522
Claims priority, application Japan, Jun. 18, 1984, 59-89420[U]
Int. Cl.[4] F21M 3/02
U.S. Cl. 362—267 9 Claims



1. An automotive lamp unit comprising:

a lamp housing in which an electric bulb is installed;

a lens fixed to said lamp housing in a manner to define in said lamp housing a chamber;

a heat shielding plate disposed in said chamber;

first means for tightly supporting said heat shielding plate in a manner to define a given clearance between said heat shielding plate and the inner surface of said chamber, said clearance being positioned on the opposite side of said plate with respect to said electric bulb;

a desiccant pack disposed in said given clearance; and

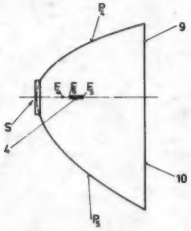
second means for fixing said desiccant pack to said heat shielding plate.

4,612,608

DIMMED VEHICLE HEADLIGHT

Wolfgang Peitz, Erwitte, Fed. Rep. of Germany, assignor to Westfälische Metall Industrie KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,324
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340462
Int. Cl.[4] F21U 7/00
U.S. Cl. 362—297 21 Claims



1. A dimmed vehicle headlight comprising:

a light source extending in the direction of a light beam to be emitted; and

a concave reflector surrounding the light source

where planar sections through the reflector surface approximate sections of cones which have the same vertex point disposed in the opposite direction of the beam direction relative to the light source such that the vertex point forms the center of a Cartesian coordinate system and where the spacing of the close point of the light source relative to the vertex point is designated af f_1 and where the distance of the remote point of the light source relative to the vertex is designated as f_2 and where a y-axis is

disposed at the connection line from the vertex to the light source and where the cone section shaped surfaces are in a coordinate system where an x-axis runs through the vertex point in a plane containing the respective cone section and where the cone sections approximate the following equation

$$y^2(A)=2p(A)x+kp(A)x^2$$

where A is the absolute value of the intersection angle of the respective cone section plane with a horizxontal plane, where p(A) is between about $0.95f_1$ and $1.05f_1$ for cone sections disposed in a horizontal plane containing the vertex point,

where p(A) is between from about $2f_1-f_2$ to f_1 for the cone section disposed above said horizontal plane and disposed in a vertical plane,

where p(A) is a continuous decreasing function of the angle A for cone sections disposed above said horizontal plane,

where p(A) is about equal f_2 for the cone section disposed belowsaid horizontal plane and disposed in a vertical plane,

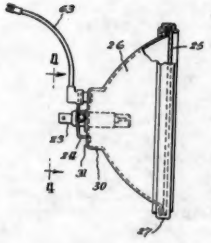
with the proviso that at least for an intersection angle of cone section plane and horizontal plane of about 31 degrees the value p(A) starts to be different from P(O), and where k can have a value from about—0.02 to 0.02.

4,612,609

LIGHT ASSEMBLY WITH REMOVABLE BULB

William J. Collins, Boulder, Colo., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Aug. 10, 1984, Ser. No. 639,061
Int. Cl.⁴ H01G *1/14*
U.S. Cl. 362—306 **9 Claims**



1. A light assembly comprising:

(a) an integral reflector having a generally parabolic reflecting wall with a front end including a generally cylindrical wall which extends rearwardly from the generally parabolic reflecting wall, and a rear end and a rear wall which extends generally perpendicularly to the axis of the reflecting wall, the rear wall having a bulb opening therein and a pair of spring retainer openings,

(b) a bulb assembly comprising a light bulb and a generally flat flange attached to the light bulb, the light bulb extending through the bulb opening in the rear wall of the reflector and the flange engaging the rear wall of the reflector, and

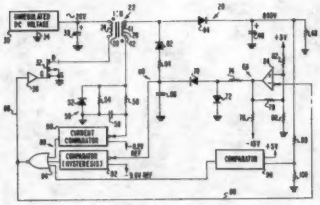
(c) a retainer spring mounted on the reflector and holding the flange of the bulb assembly against the rear wall of the reflector, the retainer spring having a pair of end portions which are inerted into the spring retainer openings in the rear wall of the reflector.

4,612,610

POWER SUPPLY CIRCUIT UTILIZING TRANSFORMER WINDING VOLTAGE INTEGRATION FOR INDIRECT PRIMARY CURRENT SENSING

Robert P. Farnsworth, and John J. Nesler, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 6, 1984, Ser. No. 586,591
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—26 **9 Claims**



1. In a transformer-coupled flyback switching regulator power supply having an input circuit for connection to a source of electric power and an output circuit including a storage capacitor for delivery of electric power to a load, there being a transformer having a primary winding connected to the input circuit and a secondary winding connected through a diode network to teh storage capacitor, adapted for coupling energy from the input circuit to the storage capacitor in the form of pulses of current induced in the secondary winding, a power-flow control circuit comprising:

Pulsing means disposed in said input circuit for initiating and terminating input pulses of electric power from said source to said primary winding;

integrating means disposed in said output circuit for sensing an electrical parameter proportional to magnetic flux developed in a core of said transformer in response to said input pulses;

current sensing means disposed in said output circuit for sensing current flow in said secondary winding; and

logic means having inputs connected to said integrating means and current sensing means with an output connected to the pulsing means, adapted to provide an output signal to initiate a pulse of energy through the primary winding when the current sensing means detects a current through the secondary winding below a given threshold, with the logic means being further adapted to provide an output signal to said pulsing means to terminate said pulse when the integrating means detects that said electrical parameter exceeds a given threshold whereby said storage capacitor is charged to a predetermined magnitude through a series of pulses without saturating the transformer.

4,612,611

STARTING CIRCUIT FOR A PARALLEL RESONANT CIRCUIT INVERTER

Hans G. Matthes, Wermelskirchen, and Hasso Wittenbecher, Remscheid, both of Fed. Rep. of Germany, assignors to A.E.G. Elotherm GmbH, Remscheid, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,763
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331690
Int. Cl.⁴ H02M *7/517*
U.S. Cl. 363—49 **7 Claims**

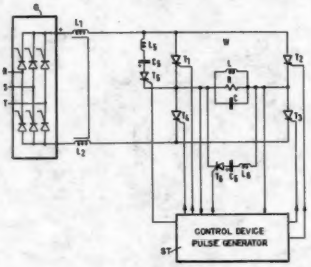
1. An inverter for driving a load which is a parallel resonant circuit comprising:

at least one inductance device;

at least two series-connected thyristors which bias said in-

ductance device by forming a current path across said inductance device when said thyristors are conducting;

starting circuit means for applying a starting signal to the load, including, (a) a first separately charged capacitor, (b) first switch means for discharging said first capacitor to the load, (c) a second separately charged capacitor, and (d) second switch means for discharging said second capacitor to one of said at least two series-connected thyristors located in the biasing circuit of said inductance device with a current direction which is opposite to the direction of the current flowing during the biasing of said inductance device so that said one of the thyristors is reverse biased and removed from conduction; and



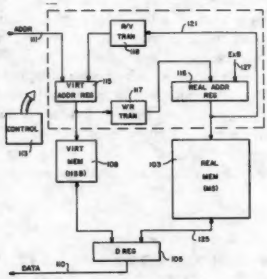
control means for initiating the discharging of the second capacitor by means of said second switch means as a function of a rate of change of a voltage produced across the load when said first capacitor discharges.

4,612,612

VIRTUALLY ADDRESSED CACHE

Gary A. Woffinden, Scotts Valley; Donald L. Hanson, Los Altos Hills, and Gene M. Amdahl, Atherton, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 527,678
Int. Cl.[4] G06F *9/32, 9/36*
U.S. Cl. 364—200 **11 Claims**



1. A memory unit for use in a data processing system having both virtual memory address space and real memory address space where the data processing system specifies memory locations with logical addresses where the logical addresses are either real addresses or virtual addresses, the memory apparatus comprising,

a virtual store having a virtual address space directly addressed by virtual addresses without need to translate the virtual address to real address,

a real store having a real address space addressed by real addresses,

a virtual-to-real translator for translating virtual addresses to provide real addresses,

a real-to-virtual address translator for translating real addresses to virtual addresses,

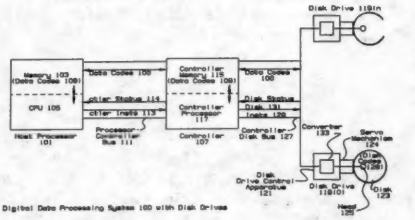
control means for causing said virtual-to-real translator to provide a translation whenever a real address corresponding to a virtual address is required for addressing the real store and causing said real-to-virtual translator to provide a translation whenever a virtual address corresponding to a real address is required for addressing the virtual store.

4,612,613

DIGITAL DATA BUS SYSTEM FOR CONNECTING A CONTROLLER AND DISK DRIVES

Edward Gershenson, Worcester; Louis A. Lemone, Stow; Salvatore Faletra, Framingham; Stephen A. Caldara, Wayland; Mark C. Lippitt, Ashland, and William A. Braun, Lexington, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 16, 1983, Ser. No. 495,181
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **11 Claims**



Digital Data Processing System 100 with Disk Drives

1. A digital data bus system for connecting a disk drive controller to a disk drive comprising:

(1) a data transfer bus for transferring data codes between said controller and said disk drive; and

(2) a header/data mode bus for providing a header mode signal and a data mode signal from said controller to said disk drive,

and wherein

said disk drive includes

(a) disks whereon data codes are stored in track sectors, each one of said track sectors including a header portion and a data portion and

(b) disk drive control means connected to said disks and including data transfer means connected to said data transfer bus and said header/data mode bus and responsive to said header mode signal and said data mode signal for transferring said data codes in a current said header portion of a current track sector of said track sectors from said disks to said data transfer bus when said header/data mode bus is carrying said header mode signal and transferring said data codes in a current said data portion of said current track sector between said disks and said data transfer bus when said header/data bus is carrying said data signal and said controller includes

(a) means connected to said data transfer bus for providing said data codes to and receiving said data codes from said data transfer bus,

(b) sector transfer termination means for determining whether a transfer of said data codes to or from said current data portion is complete,

(c) header compare means for determining whether said data codes received from said current header correspond to an expected header, and

(d) means connected to said header/data mode bus and responsive to said sector transfer termination means and

said header compare means for providing said data mode signal on said header/data mode bus when said header compare means determines that said data codes received from said current header correspond to said expected header, continuing to provide said data mode signal until said sector transfer termination means determines that said transfer of said data codes to or from said current data portion is complete, and thereupon again providing said header mode signal.

4,612,614
METHOD OF ANALYZING PARTICLES IN A FLUID SAMPLE

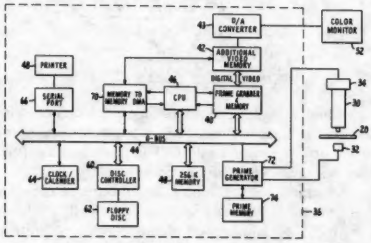
Fred H. Deindoerfer, Northridge; Sherman E. DeForest, Del Mar, and Gunner Bolz, Solana Beach, all of Calif., assignors to International Remote Imaging Systems, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 186,418, Sep. 12, 1980, Pat. No. 4,393,466. This application Jul. 11, 1983, Ser. No. 512,647

The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—415 **26 Claims**



1. A method of analyzing particles from a fluid sample containing said particles comprising:

distributing said fluid sample over an extended area with substantially no particle overlapping other particles;

forming a plurality of optical still images of said sample, including said particles, over said area, with each optical still image representing a different portion of said area;

converting each of said optical still images to an electronic image thereby converting optical still images of said particles into electronic images of said particles;

extracting images of said particles from said electronic images; and

displaying said electronic images of said particles in an ordered array by classes of visually discernible characteristics.

4,612,615
THROTTLE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Terukiyo Murakami, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 9, 1984, Ser. No. 597,915

Claims priority, application Japan, Apr. 11, 1983, 58-63284

Int. Cl.[4] F02D *9/00*; G06G *7/70*

U.S. Cl. 364—431.07 **3 Claims**

1. A throttle control system for an automotive vehicle, which comprises:

(a) an accelerator pedal;

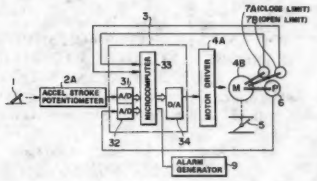
(b) a throttle valve having an extreme open position and an extreme closed position;

(c) means for detecting a stroke of said accelerator pedal and outputting an accelerator pedal stroke signal;

(d) means for calculating a target throttle valve opening position in response to the detected accelerator pedal stroke signal and generating a target throttle valve opening position control command signal corresponding thereto;

(e) means for detecting an actual throttle valve opening position and outputting an actual throttle valve opening position signal corresponding thereto;

(f) means for driving said throttle valve in response to the target throttle valve opening position control command signal and the actual throttle valve opening position signal;



(g) means for detecting that said throttle valve is driven to one of said extreme positions and outputting a throttle valve extreme position signal corresponding thereto; and

(h) means responsive to the target throttle valve opening position control signal, the actual throttle valve opening position and the throttle valve extreme position signal for generating an abnormality command signal when the difference between the target throttle opening position and the actual throttle valve opening position exceeds a predetermined value when the throttle valve extreme position signal is detected.

4,612,616
FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

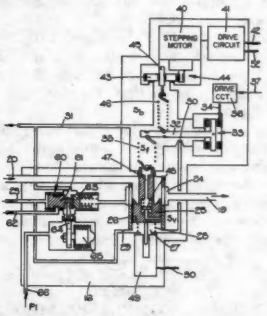
John M. Binns, Sutton Coldfield, England; Douglas A. Caine, Ramsey, and Byron A. T. Spencer, Hillside, both of N.J., assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 19, 1984, Ser. No. 632,535

Claims priority, application United Kingdom, Jul. 28, 1983, 8320319

Int. Cl.[4] F02C *9/02*

U.S. Cl. 364—431.02 **10 Claims**



1. A fuel control system for a gas turbine engine, comprising a fuel metering device, control means for positioning said metering device, means for generating first and second electrical signals in response to operating conditions of said engine, a stepping motor responsive to said first electrical signals, means for regulating a first force output in response to operation of said stepping motor, a torque motor for providing a second

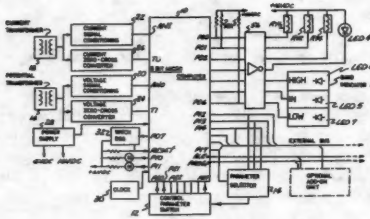
force output corresponding to said second electrical signal, and means for summing said first and second force outputs so that a change in said first force output in response to said first electrical signal acts on said control means more slowly than said second force output, said control means being responsive to the sum of said force outputs for positioning said metering device, whereby in the absence of said electrical signals said metering device is positioned in accordance with an operated position of said stepping motor.

4,612,617

METHOD AND APPARATUS FOR MONITORING INSTANTANEOUS ELECTRICAL PARAMETERS OF A POWER DISTRIBUTION SYSTEM

Carl J. Laplace, Jr., Covington, and Conrad F. Williams, New Orleans, both of La., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Mar. 2, 1983, Ser. No. 471,302
Int. Cl.[4] G06F *15/56*
U.S. Cl. 364—483 **23 Claims**



1. A method for monitoring instantaneous electrical parameters being present in a circuit of a power distribution system under load, the method utilizing digital control means adapted to be connected to said circuit and including the steps of:

(a) sensing the present load condition of the circuit and deriving an equivalent analog signal constituting one electrical characteristic of the electro-motive power present in said circuit;

(b) rating down said analog signal to a range suitable for processing by an integrated electronic circuit;

(c) converting the rated analog signal into a binary coded digital signal comprising a value of n digits;

(d) sampling a plurality of subsequent binary digital signals during a sampling period;

(e) deriving from each of the sampled digital signals a respective squared value with a format of 2n digits and accumulating each respective squared value obtained during one sampling period of a sum value composed of 2n+m digits;

(f) forming a square root value of said sum value, said square root value comprising n+k digits; and

(g) rescaling said square root value to a true root means square value by performing k left shifts on the square root value and storing said true root mean square value,

whereby the rescaled value represents an accurate measurement of said electrical characteristic.

4,612,618

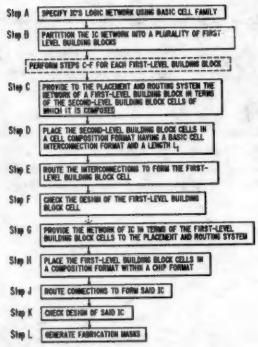
HIERARCHICAL, COMPUTERIZED DESIGN OF INTEGRATED CIRCUITS

Richard L. Pryor, Voorhees, N.J., and William M. Cowhig, Philadelphia, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 10, 1983, Ser. No. 503,042
Int. Cl.[4] G06F *15/606*
U.S. Cl. 364—490 **16 Claims**

1. In a computer process for designing an IC by composing a semiconductor chip having a chip from a plurality of basic cells, each selected from a family of basic cells in which each cell conforms to a first common basic cell interconnection format which enables said computer process to arrange a plurality of said cells in a row and which defines the locations in said cell to which said process must to able to route conductors in the process of designing said IC, chip format being different from said basic cell interconnection format, the improvement comprising the steps of:

(a) composing an arrangement of a plurality of said basic cell


Step A
SPECIFY IC'S LOGIC NETWORK USING BASIC CELL FAMILY
Step B
PARTITION THE IC NETWORK INTO A PLURALITY OF FIRST LEVEL BUILDING BLOCKS
PERFORM STEPS C-F FOR EACH FIRST-LEVEL BUILDING BLOCK
Step C
PROVIDE TO THE PLACEMENT AND ROUTING SYSTEM THE NETWORK OF A FIRST-LEVEL BUILDING BLOCK IN TERMS OF THE SECOND-LEVEL BUILDING BLOCK CELLS OF WHICH IT IS COMPOSED
Step D
PLACE THE SECOND-LEVEL BUILDING BLOCK CELLS IN A CELL COMPOSITION FORMAT HAVING A BASIC CELL INTERCONNECTION FORMAT AND A LENGTH L_1
Step E
ROUTE THE INTERCONNECTIONS TO FORM THE FIRST-LEVEL BUILDING BLOCK CELL
Step F
CHECK THE DESIGN OF THE FIRST-LEVEL BUILDING BLOCK CELL
Step G
PROVIDE THE NETWORK OF IC IN TERMS OF THE FIRST-LEVEL BUILDING BLOCK CELLS TO THE PLACEMENT AND ROUTING SYSTEM
Step H
PLACE THE FIRST-LEVEL BUILDING BLOCK CELLS IN A COMPOSITION FORMAT WITHIN A CHIP FORMAT
Step J
ROUTE CONNECTIONS TO FORM SAID IC
Step K
CHECK DESIGN OF SAID IC
Step L
GENERATE FABRICATION MASKS

to define a higher order building block cell conforming to a second common basic cell interconnection format, like said first common basic cell interconnection format but with larger overall dimensions; and

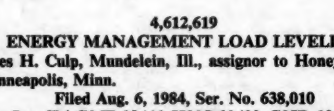
(b) performing step (a) a plurality of times to create a family of said higher order building block cells each of which conforms to said second common basic cell interconnection format whereby said higher order buidling block cells are themselves composible in the same manner by said computer process into still higher order structures.

4,612,619

ENERGY MANAGEMENT LOAD LEVELING

Charles H. Culp, Mundelein, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 6, 1984, Ser. No. 638,010
Int. Cl.[4] G06F *15/46;* H02J *13/00;* G05B *19/00*
U.S. Cl. 364—492 **8 Claims**



1. A system for leveling energy consumption of loads being controlled by a duty cycle routine, the loads having on times and off times within a predetermined period of time established by said duty cycle routine, said system comprising:

a plurality of loads;

communication means connected to each of said loads; and,

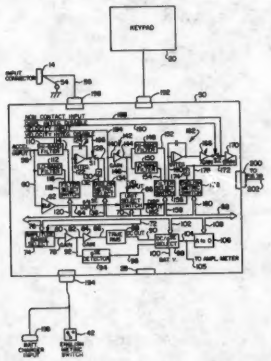
controller means connected to said communication means, said controller means determining a gap time, said gap time being a function of said period of time, the sum of said off times for at least some of said loads, and the number of said at least some of said loads, said controller means scheduling said loads to be off, said off times of said at least some of said loads being distributed over said

period of time with said gap time existing between adjacent off times of said at least some of said loads.

4,612,620
APPARATUS FOR COLLECTING SCHEDULED MAINTENANCE DATA

Dean T. Davis, and Kenneth E. Hays, both of Columbus, Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Jun. 6, 1983, Ser. No. 501,624
Int. Cl.[4] G01M *7/00, 1/22*
U.S. Cl. 364—551 **12 Claims**



1. In a system for carrying out maintenance data collection at identifiable machines and test locations thereon wherein a select type vibration transducer is operationally contacted with a predetermined sequence of said machines and said locations for generating vibration signals in connection with a maintenance data program and a data processing and collection scheduling facility is provided for treating machine data, the improved hand held data collection apparatus comprising:

a housing;

input connector means for operationally coupling said housing with a said vibration transducer and receiving vibration signals therefrom;

signal treatment means within said housing for receiving said vibration signals and selectively treating them when actuated to derive predetermined units categorized amplitude signals;

converter means within said housing, responsive to said amplitude signals for generating digital signals corresponding therewith;

visually perceptible readout means mounted upon said housing for displaying readout characters corresponding with character signals submitted thereto;

keyed means mounted upon said housing and manually actuable for deriving select function and numeric signals;

data transfer connector means mounted upon said housing for selectively receiving and transferring data signals;

mode selection means actuable to derive data input and data transfer mode conditions;

memory means for selectively retaining data submitted thereto;

control circuit means within said housing,

responsive in the presence of said data transfer mode condition when said data transfer connector means is operationally coupled in data transfer relationship with said scheduling facility for selectively effecting the receipt therethrough of schedule data representing a said predetermined sequence of identified said machines, each said test location thereon, the direction of mounting of said vibration transducer for each said test location, the vibration parameter unit for each said test location, and alarm threshold data for said test locations, for effecting the submittal of said schedule data to said memory means for retention,

responsive in said data input mode condition to said keyed means actuation deriving an advance said function signal for accessing predetermined said memory means retained schedule data and submitting said schedule data as character signals to said readout means,

responsive to said schedule data representing a said vibration parameter unit derived by said advance function signal to actuate said signal treatment means in correspondence therewith,

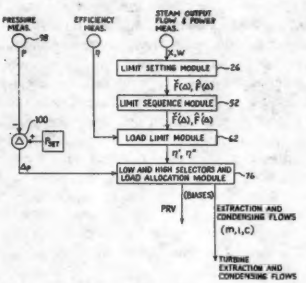
responsive in said data input mode condition to said converter means digital signals for deriving character signals corresponding therewith and effecting the submittal thereof to said readout means, and

responsive further in said data input mode condition to said keyed means actuation deriving a store said function signal for effecting the retention by said memory means of data corresponding with said character signals effecting said readout display.

4,612,621
DISTRIBUTED SYSTEM FOR OPTIMIZING THE PERFORMANCE OF A PLURALITY OF MULTI-STAGE STEAM TURBINES USING FUNCTION BLOCKS

Azmi Kaya, Akron, and Marion A. Keyes, IV, Chagrin Falls, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 17, 1983, Ser. No. 476,088
Int. Cl.[4] G05B *13/02;* **G06F** *15/46*
U.S. Cl. 364—494 **5 Claims**



1. A distributed system for optimizing the performance of a plurality of multi-stage steam turbines comprising:

means for measuring the steam output flow from the multi-stages of said steam turbines and establishing a series of steam output signals;

means for measuring the output power produced by said steam turbines and establishing a series of output power signals;

limit setting means responsive to said series of output power signals and said series of steam output signals for establishing a logic 1 signal if said steam output and output power signals are within preset limits and a logic 0 signal if said steam output and output power signals are not within preset limits;

limit sequencing means responsive to said logic signals of said limit setting means for establishing either a logic 1 signal, a logic 0 signal, or a high level output signal G;

means for measuring the efficiency of each of the multi-stages of said steam turbines and establishing a series of efficiency signals;

means establishing a load increase limit signal in response to output signals from said efficiency measuring means and said limit sequencing means;

pressure measuring means for measuring the pressure of the

outputs of said turbines and establishing a signal indicative thereof; and

load allocation means responsive to the output signal from said pressure measuring means and said load increase limit establishing means for assigning a decrease in load demand to the lowest efficiency turbine and an increase in load demand to the highest efficiency turbine.

4,612,622

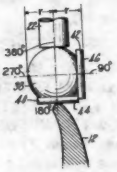
PROBE FOR COORDINATE MEASURING MACHINE

James D. May, Enfield, and Charles E. Gosselin, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 12, 1983, Ser. No. 513,183

Int. Cl.[4] G01B *5/20, 7/02, 7/28*

U.S. Cl. 364—560 **5 Claims**



4. A probe for a coordinate measuring machine that takes measurements in three dimensions and responds to computer calculated signals, the contact portion of said probe being generally spherically shaped, the improvement comprising an elongated bar-like element mounted in a vertical recess formed in the center of said generally spherically shaped member and the transverse dimension of said bar-like member being such that its outer surface lies tangent to the outer removed surface of the generally spherically shaped member at the 90° quadrant relative to the vertical axis of the generally spherically shaped member, another bar-like element mounted in a horizontal recess formed in the center of said generally spherically shaped member and the transverse dimension of said bar-like member being such that its outer surface lies tangent to the outer removed surface of the generally spherically shaped member at the 180° quadrant relative to the vertical axis of the generally spherically shaped member, and being perpendicular to said bar-like member.

4,612,623

TAMPER-RESISTANT, RUNNING TIME MAINTENANCE MONITOR WITH INDIVIDUALIZED MAINTENANCE MESSAGE AND METHOD

Louis M. Bazarnik, Jericho, N.Y., assignor to Maintenance Technology, Inc., Long Island City, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,300

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—569 **25 Claims**

1. A tamper-resistant, running time maintenance monitor for indicating that equipment operatively connected to the monitor is due for maintenance, said monitor comprising:

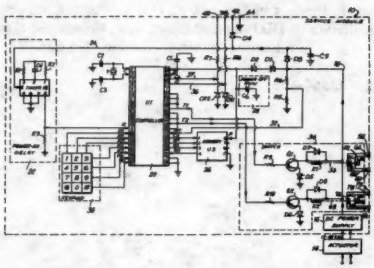
(a) data entry means for manually entering an individualized access code, and for manually entering a maintenance time for the equipment to be maintained;

(b) data storage means for storing the individualized access code and the maintenance time;

(c) running time sensor means for detecting the running time of the equipment each time the latter is operated;

(d) control means operatively connected to the data entry means and the data storage means, and including verification means for verifying that a subsequently entered code matches the stored code, and enabling means for enabling the stored maintenance time to be changed when the subsequently entered code matches the stored code to resist tampering with the stored maintenance time, and

said control means also being operatively connected to the running time sensor means, and also including accumulator means for accumulating each detected running



time, and means for generating a maintenance signal when the accumulated running time matches the stored maintenance time; and

(e) display means operatively connected to the control means, and operative for displaying a maintenance message upon generation of the maintenance signal.

4,612,624

DEMAND ESTIMATION APPARATUS

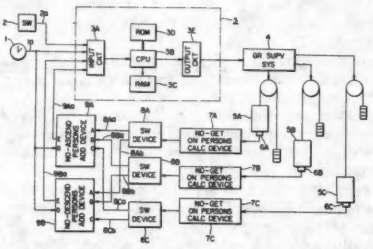
Shintaro Tsuji, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,234

Claims priority, application Japan, Oct. 25, 1982, 57-187063; Oct. 25, 1982, 57-187064

Int. Cl.[4] G06G *7/12*

U.S. Cl. 364—581 **7 Claims**



1. A demand estimation apparatus for controlling machines wherein a cycle of a cyclically fluctuating demand is divided into a plurality of sections of given time widths comprising:

means for measuring the demand in each section by cumulating demand meaurements taken a varying number of times for each section and producing measured demand values with an increasing weighting parameter for successively newer measured values;

means for determining an estimated value for the demand in each section on the basis of the measured value of the demand in each section and a weight coefficient; and

weighting setting means to change the weight coefficient for the estimated demand values for a given section in accordance with the number of times of cumulation of demand measurements for said given section varying from a preset lower limit value to a preset upper limit value; and when the number of times of cumulation of the demand measurement for a given section has reached the preset upper limit value, the number of times of cumulation is

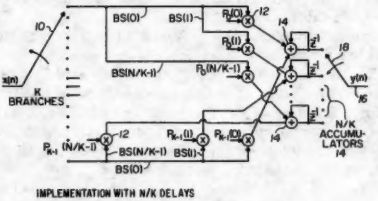
reset to the preset lower limit whereupon the weight coefficient is changed.

4,612,625

DECIMATOR EMPLOYING FINITE IMPULSE RESPONSE DIGITAL FILTERS

John Bertrand, Upper Nyack, N.Y., assignor to Wavetek Rockland Scientific, Inc., Rockleigh, N.J.

Filed Oct. 12, 1983, Ser. No. 541,050
Int. Cl.⁴ G06F *15/31*
U.S. Cl. 361—724 **2 Claims**



IMPLEMENTATION WITH N/K DELAYS

1. A decimator of the type implemented by a finite impulse response filter network of length N, the decimator having a decimation factor of K, comprising:

input commutator means for distributing K samples of an input signal to be decimated in time sequential relation, wherein N>K;

K circuit branches wherein each circuit branch leads into N/K associated branch sets, each of said circuit branches being coupled at one end to said input commutator means, and including multiplication means in each of said branch sets for providing associated multiplication factors;

N/K accumulators each coupled to the outputs of associated ones of said multiplication means, for arithmetically combining input samples as multiplied in said N/K branch sets of each of said K circuit branches, and for providing a corresponding output sample; and

output commutator means coupled to said N/K accumulators for sequentially providing the output samples obtained from each of said accumulators to a filter output in sufficient time so that N/K output samples corresponding to every set of N input signal samples are provided at the filter output prior to arrival of the next set of N input signal samples at said commutator means.

4,612,626

METHOD OF PERFORMING REAL INPUT FAST FOURIER TRANSFORMS SIMULTANEOUSLY ON TWO DATA STREAMS

Jeffrey D. Marchant, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,991
Int. Cl.⁴ G06F *15/332*
U.S. Cl. 364—726 **4 Claims**

1. A method of performing real input FFT's simultaneously on two sequences of digital data comprising the steps of:

applying said sequences simultaneously to two orthogonally related complex function generators in a predetermined manner;

operating said complex function generators to produce outputs thereof;

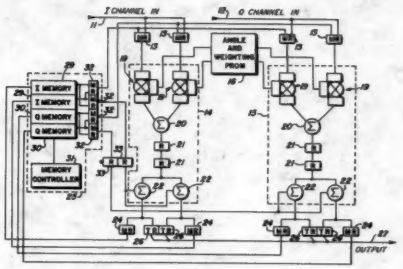
storing said outputs of said complex function generators;

applying said stored outputs to said function generators in a predetermined manner;

repeating said steps of, operating and storing a predetermined number of times and repeating said step of applying said stored outputs said predetermined number of times minus one;

re-ordering said stored outputs of a final repetition of said steps of applying said stored outputs, operating and storing in a predetermined manner;

applying said re-ordered outputs to said function generators; and



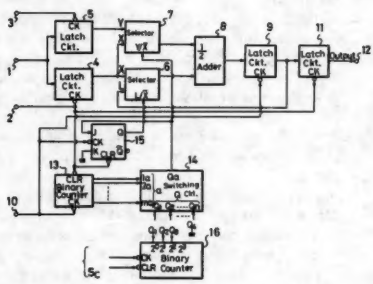
operating said function generators to produce substantially unscrambled FFT outputs corresponding to said digital data sequences.

4,612,627

DIGITAL SIGNAL COMPOSING CIRCUIT FOR CROSS-FADE SIGNAL PROCESSING

Takehiro Sugita, Chigasaki; Akira Sakamoto; Takeshi Fukami, both of Tokyo; Michimasa Komatsubara, Chiba, and Akira Shimizu, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,956
Claims priority, application Japan, Dec. 27, 1982, 57-230601
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—736 **5 Claims**



1. A digital cross-fader circuit for cross-fading from a first digital signal to a second digital signal, comprising:

first selecting means responsive to a first control signal for supplying either of said first and second digital signals as a first selected signal;

second selecting means responsive to a second control signal for supplying one of said first digital signal and a summed signal as a second selected signal;

adding means for receiving said first and second selected signals and for adding one-half of said first selected signal and one-half of said second selected signal to produce said summed signal;

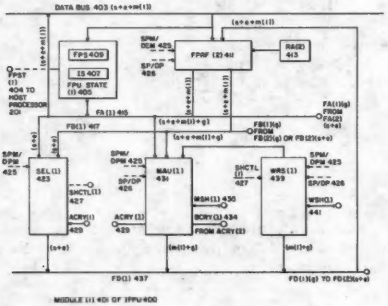
signal output means for supplying an output signal in response to said summed signal; and

controller means for producing said first and second control signals so that said output signal from said signal output means cross-fades from said first digital signal to said second digital signal.

4,612,628
FLOATING-POINT UNIT CONSTRUCTED OF IDENTICAL MODULES

Robert W. Beauchamp, Milford, Mass., and George P. Springer, Houston, Tex., assignors to Data General Corp., West Borough, Mass.

Filed Feb. 14, 1983, Ser. No. 465,955
Int. Cl.[4] G06F *7/48, 12/00*
U.S. Cl. 364—748 32 Claims



1. A floating-point unit for performing calculations on items of floating-point data, each one of said items consisting of bits specifying a sign, an exponent, and a mantissa having one of a plurality of precisions, said floating-point unit comprising:

(1) a plurality of identical modules for processing said floating-point data, each one of said identical modules including

(a) sign and exponent processing means for performing operation on said signs and said exponents of said items,

(b) mantissa processing means for performing operations on said mantissas of said items, and

(c) reconfiguration means within each said module for reconfiguring that module responsive to position specifier signals specifying the position of that module in said floating-point unit and to precision specifier signals specifying said precision of said items currently being processed by said floating-point unit, said reconfiguration means including

(i) means for enabling said sign and exponent processing means only on a first module of said plurality of modules and

(ii) means for inhibiting all said mantissa processing means not required to process said mantissas;

(2) backpanel means comprising sockets for receiving each of said identical modules and for providing input output connections to said identical modules, the backpanel means including

(a) means for providing said position specifier signals and said precision specifier signals to each one of said modules; and

(b) interconnection means for interconnecting said modules so that certain bits of said mantissas and certain signals for controlling said modules are passed among said modules.

4,612,629
HIGHLY SCALABLE DYNAMIC RAM CELL WITH SELF-SIGNAL AMPLIFICATION

Eliyahou Harari, 2320 Friars La., Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 355,966, Mar. 8, 1982, Pat. No. 4,448,400, which is a continuation-in-part of Ser. No. 282,882, Jul. 13, 1981, Pat. No. 4,417,325. This application Sep. 30, 1983, Ser. No. 537,477
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—185 46 Claims

1. A memory cell comprising:

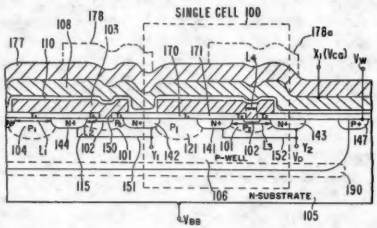
semiconductor material of first conductivity type, said semiconductor material having a surface;

first, second, third and fourth regions of a second and opposite conductivity type formed in said semiconductor material adjacent to said surface, said first and second regions being separated by a first zone of said semiconductor material, said second and third regions being separated by a second zone of said semiconductor material, said third and fourth regions being separated by a third zone of said semiconductor material;

a first insulation layer formed on said semiconductor material;

a contact opening formed through said first insulation layer to said third region;

a first electrode attached to said third region through said contact opening in said first insulation layer, said first electrode being electrically isolated from said first, second and fourth regions, said first electrode extending on said first insulation layer over said second zone, over said second region and over at least part of said first zone, said first insulation layer being formed between said first electrode and said semiconductor material;



a second insulation layer formed to cover said first electrode;

a second electrode formed on said second insulation layer over said first electrode, said second electrode also extending on a third insulation layer over said third zone to said fourth region, said second electrode forming a word line, said first electrode and said word line forming a dual electrode structure, said dual electrode structure forming a read transistor with channel length measured by the extent of said first zone between said first and second regions and channel width measured by the extent of not more than the width of said first electrode, said dual electrode structure also forming a write transistor with a channel whose length is measured by the extent of said third zone between said third and fourth regions and whose width is measured by the extent of not more than the width of said word line;

an isolation region formed in said second zone;

a field isolation region surrounding said read and write transistors; and

a storage junction formed between said third region and said semiconductor material of said first conductivity type.

4,612,630
EEPROM MARGIN TESTING DESIGN

Brian K. Rosier, Jenkintown, Pa., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 27, 1984, Ser. No. 635,218
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—201 13 Claims

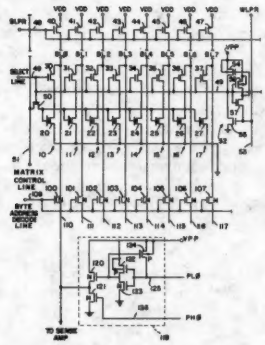
6. A programmable read only memory comprising:

a plurality of programmable threshold memory cell, each having a control input, a select input and an output;

means connected to said cells select input for addressing said memory cells;

means connected to said cells output for monitoring the resistance state of said addressed memory cells; and

control means connected to said control input of said memory cells and responsive to mode signals for applying a read control signal to said control input in response to a read mode signal, applying a variable voltage signal of a first polarity to said control input to measure a high voltage threshold of a cell programmed to have a high threshold in response to a high threshold test mode signal, and applying a zero voltage signal to said control input to determine if a low voltage threshold of a cell programmed to a low voltage threshold has a low voltage threshold of a second polarity in response to a low threshold test mode signal.



4,612,631

STATIC TYPE SEMICONDUCTOR MEMORY CIRCUIT

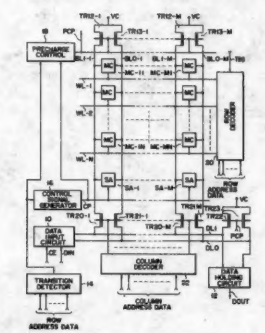
Kiyofumi Ochii, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 23, 1984, Ser. No. 592,796

Claims priority, application Japan, Mar. 30, 1983, 58-54323

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—203 **11 Claims**



1. A semiconductor memory circuit responsive to address data comprising:

a plurality of memory cells;

a plurality of word lines and bit lines which are connected to said plurality of memory cells to select at least one of said plurality of memory cells;

sense amplifier means coupled to said plurality of bit lines;

transition detecting means for generating an output signal when said transition detecting means detects that address data has been changed;

word line selection means for selecting at least one of said plurality of word lines in response to the address data;

control means for supplying a control signal to said sense amplifier means to set said sense amplifier means in an operative mode for a predetermined period of time in response to said output signal from said transition detecting means, thereby to cause the reading of data in a given memory cycle from said at least one selected memory cell onto those of said plurality of bit lines connected to said at least one selected memory cell;

data holding means for holding data read out from said at least one selected memory cells through those of said plurality of bit lines connected to said at least one selected memory cell; and

potential setting means for setting said bit lines to an initial potential level within said given memory cycle after the data read out from said at least one selected memory cells in the given memory cycle are held in said data holding means.

4,612,632

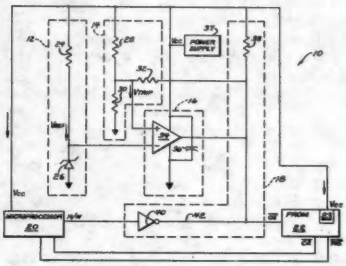
POWER TRANSITION WRITE PROTECTION FOR PROM

Anthony M. Olson, Stevensville, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 10, 1984, Ser. No. 679,784

Int. Cl.⁴ G11C *29/00, 7/00*

U.S. Cl. 365—226 **7 Claims**



1. For use with a nonvolatile electrically erasable programmable read only memory (EEPROM) and a microprocessor coupled by means of a bi-stable OUTPUT-ENABLE control line wherein the microprocessor provides an enable signal via said OUTPUT-ENABLE control line to the EEPROM for reading data from the EEPROM with the OUTPUT-ENABLE control line in a first state and writing data into the EEPROM with the OUTPUT-ENABLE control line in a second state, said EEPROM and said microprocessor further coupled to a power supply and energized by a predetermined voltage level therefrom, a circuit for preventing the inadvertent writing of data by the microprocessor into the EEPROM when the supply voltage drops below said predetermined voltage level, said circuit comprising:

supply voltage detection means including means for generating said predetermined voltage level and voltage comparison means coupled thereto and to the power supply and responsive to the supply voltage therefrom for comparing the supply voltage with said predetermined voltage level and for generating a control signal when the supply voltage drops below the predetermined voltage level; and

control means coupled to the OUTPUT-ENABLE control line and to said supply voltage detection means and responsive to said control signal output therefrom for over-

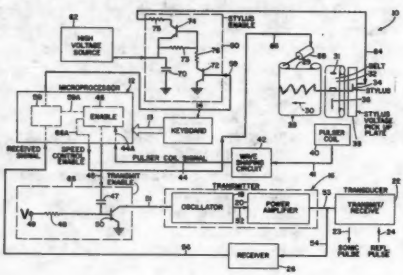
riding the enable signal from the microprocessor and maintaining the OUTPUT-ENABLE control line in said first state when the supply voltage is less than the predetermined voltage level in preventing the inadvertent writing of data by the microprocessor into the EEPROM with variations in the supply voltage of the power supply.

4,612,633

SONAR APPARATUS WITH MEANS TO TRANSMIT AND PRINT ON ALTERNATE CYCLES

Ronald G. Weber, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Jul. 1, 1983, Ser. No. 509,934
Int. Cl.[4] G01S *15/96*
U.S. Cl. 367—115 **1 Claim**



1. In a sonar apparatus for use on a boat to indicate by the reception of reflected sonic energy the presence of sonic reflection interfaces, and to record on a moving recording web across which a recording stylus is moved by a continuously rotating belt, including means responsive to said moving belt to produce a cycle starting signal, means responsive to said cycle starting signal to enable an electrical oscillator and power amplifier to transmit to a sonic transducer a high frequency pulse of electrical energy to cause said transducer to emit a downgoing sonic pulse, means connected to said transducer for detecting return reflection signals and for amplifying said reflection signals for generating high voltage pulses, and means to apply said pulses to said stylus and to said web, the improvement comprising:

(a) means on command to disable said electrical oscillator and power amplifier on at least each alternate cycle providing a disabling mode;

(b) means to disable said means for generating high voltage pulses on at least each alternate cycle in synchronism with the disabling of said oscillator and power amplifier during said disabling mode; and

(c) means to slow down the rate of movement of said web when said apparatus is operating in the disabling mode.

4,612,634

INTEGRATED DIGITAL NETWORK (IDN)

John C. Bellamy, Coppell, Tex., assignor to Data General Corporation, Westborough, Mass.

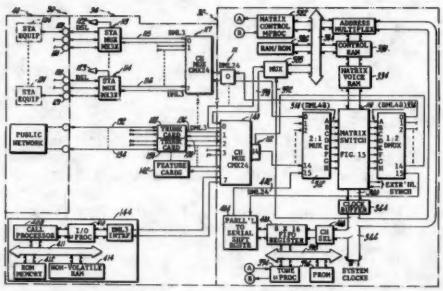
Filed Apr. 26, 1984, Ser. No. 604,093
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **8 Claims**

1. An integrated digital network (IDN) for exchanging digital signal information between user signal equipment, comprising:

plurality of station devices, each having a station I/O interface, and each having a plurality of signal port input/output (I/O) interfaces responsive to a cluster of user equipment each signal port I/O exchanging digital signal information with user equipment in signal bit packets of pulse code modulated (PCM) voice, data, and port control bit samples, by receiving an equipment digital signal bit packet from, and transmitting an IDN digital signal bit packet to, the user equipment in each of successive IDN sample periods, said station devices in each sample period multiplexing said equipment signal packet received at each port I/O into a system input signal having a plurality of equipment signal packets at said station I/O interface and demultiplexing the plurality of IDN signal packets of a system output signal received at said station I/O into an IDN signal packet at each port I/O;

call processor means, having a station I/O, for exchanging with said station I/O in each sample period, system input and system output signals comprising a plurality of call control signal bit packets indentifying, by signal port identity, the user signal equipment exchanging information in each sample period;

transmission system means, having a plurality of system I/O interfaces for receiving and sending said system input and system output signals from and to said station I/O interfaces, and having a plurality of matrix I/O interfaces, said



transmission system multiplexing said equipment signal packets and said control signal bit packets received in each sample period at two or more system I/O interfaces into a matrix input signal comprising a plurality of serial voice, data, and control signal bit units of common signal type at each matrix I/O, said transmission system means demultiplexing the serial signal bit units of a matrix output signal received at said matrix I/O in each sample period into said control signal bit packets and equipment signal packets to provide said system output signals at two or more system I/Os; and

matrix switch means, having a plurality of switch signal inputs and switch signal outputs, arranged in pairs, one pair for each matrix I/O, said matrix switch means transferring each signal bit unit of each matrix input signal at a switch signal input to those switch signal outputs indentified by said call control signal bits for exchanging information with a switch input in each sample period, whereby each matrix output signal comprises signal bit units from different matrix input signals.

4,612,635

SEQUENTIAL DATA TRANSMISSION SYSTEM

Tom G. Leete, Plano, Tex., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Mar. 5, 1984, Ser. No. 586,154
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—89 **7 Claims**

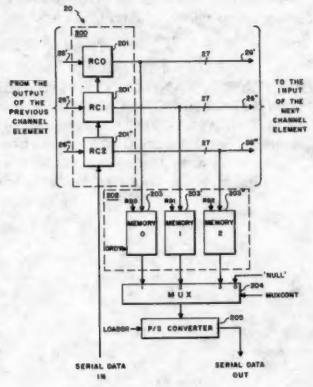
1. A data transmission system, for transmitting information from a first end-user device to a second end-user device, comprising:

(a) a plurality of channel elements, each channel element having a first input and a first output terminal adapted to receive and transmit, respectively, serial digital data having a predetermined format, the first input and first output terminals of each channel element being operatively connected to at least one corresponding end-user device, and

each channel element further having a plurality of second input terminals and a plurality of second output terminals adapted to receive and transmit, respectively, parallel digital data, wherein said channel element comprises:

(i) router means, operatively connected to said second input terminals and operatively connected to said second output terminals, and further operatively connected to said first terminal, for coupling a new block of serial digital data onto said second output terminals at a predetermined time, otherwise coupling the parallel digital data received on said second input terminals to said second output terminals, and further examining the parallel digital data received on said second input terminals to generate a control signal when the parallel digital data is addressed to the channel element;

(ii) memory means, operatively connected to said second output terminals, for storing the parallel digital data on said second output terminals in response to the control signal generated by said router means; and



(iii) converter means, operatively connected to said memory means and operatively connected to said first output terminal, for converting the parallel digital data stored in said memory means to serial digital data having said predetermined format, the serial digital data being coupled to said output first terminal; and

(b) a plurality of parallel data lines, wherein each of said parallel data lines operatively connects the second output terminals of one of said channel elements to the second input terminals of a next adjacent channel element, thereby connecting the channel elements in a ring configuration forming a ring, for causing the serial digital data received by each channel element from the corresponding end-user device to be transmitted in parallel around the ring, each channel element causing the data received via the second input terminals to be outputted serially on the first output terminal when it is determined that the data contains an address corresponding to the channel element.

4,612,636

MULTIPLE CHANNEL DEPACKETIZER

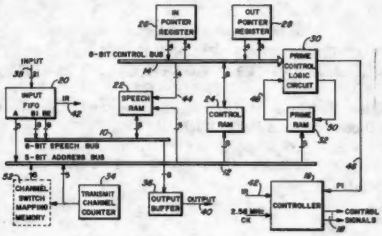
Wayne D. Grover, and Martin C. Lefebvre, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 31, 1984, Ser. No. 688,093
Int. Cl.⁴ H04J *3/26*
U.S. Cl. 370—94 **9 Claims**

1. A depacketizer for assigning synchrously to respective ones of a plurality of channels information from packets which occur asynchronously and each of which includes, in addition to said infommation, an address in respect of the channel for which the information is intended, the depacketizer comprising:

first memory means for storing packets asynchronously as they occur;

second memory means having a plurality of addressable memory blocks, one in respect of each channel, each for storing the information from a plurality of packets of the respective channel;



first address means responsive to each packet stored in the first memory means for addressing a memory block of the second memory means in dependence upon the address of the packet and storing the information of the packet in the addressed memory block;

second address means for cyclically addressing the memory blocks of the second memory means; and

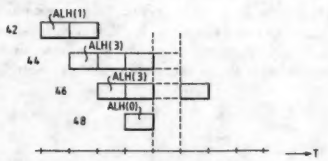
means for reading the information for each channel from the cyclically addressed memory blocks of the second memory means.

4,612,637

MULTIPLE-ACCESS COMMUNICATIONS SYSTEM

Christopher K. Davis, Cambridge; Paul J. Stein, Crawley, and Diana M. Ball, Horley, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,547
Claims priority, application United Kingdom, Aug. 1, 1983, 8320722
Int. Cl.⁴ H04J *3/16*
U.S. Cl. 370—95 **5 Claims**



1. A time division multiple-access communication system comprising a plurality of transceivers and a system controller, in which communication between the system controller and the transceivers is effected in accordance with the following protocol:

continuous transmission by the system controller of framelength signals in successive time slots, each framelength signal including an Aloha number designating an updated number of immediately succeeding time slots which are available for signaling requests, whereby a calling transceiver seeking to signal the system controller can select any one of such available time slots at random;

a calling transceiver checking the time slot immediately preceding the selected time slot to ascertain the Aloha number of the selected time slot;

when the Aloha number of the selected time slot has a prede-

termined value, the calling transceiver reverting to listening for a time slot containing an Aloha number having other than said predetermined value;

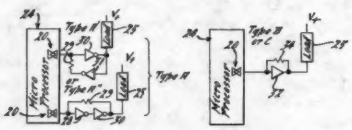
and when the Aloha number of the selected slot has other than said predetermined value, the calling transceiver signalling the system controller in such selected time slot.

4,612,638

DIAGNOSTIC PROTECTION CIRCUIT AND METHOD USING TRI-STATE CONTROL AND POSITIVE FEEDBACK

William R. Kissel, Milford, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 9, 1984, Ser. No. 597,905
Int. Cl.[4] G06F *11/00*; G01R *31/28*
U.S. Cl. 371—15 17 Claims



1. In systems controlled by electronic controllers which interface with a load network and a voltage supply, a diagnostic protection circuit for diagnosing short and open circuit conditions and for protecting the load network from damages due to the short and open circuit conditions comprising:

a port pin in the electronic controller with the ability to be configured either as an input or as an output whereby the condition of the voltage at the port pin can be monitored by the electronic controller when the port pin is configured as an input and compared by the electronic controller to the voltage presented to the port pin by the electronic controller when the port pin was configured as an output;

driver means with an input and an output for completing a circuit including the voltage supply and the load network, connected between the port pin and the load network; and

positive feedback means connected between the load network and the port pin to reflect the condition of the load network from the output of the driver means back to the input of the driver means whereby the input to the driver means changes states under short and open circuit conditions.

4,612,639

FAIL-SAFE APPARATUS AND METHOD FOR READING SWITCHES

Alan A. Figler, Algonquin, and John J. Selman, Vernon Hills, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 29, 1984, Ser. No. 676,040
Int. Cl.[4] G01R *31/28*; G06F *11/00*
U.S. Cl. 371—25 16 Claims

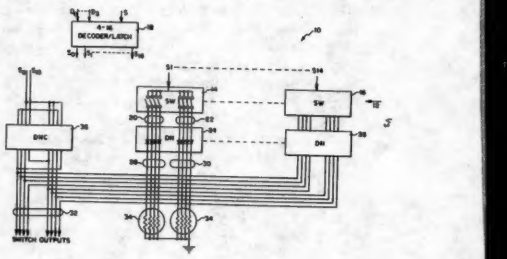
1. An apparatus for checking sensed switch settings comprising:

a plurality of manually settable multiposition switches with each switch generating a unique, selected, electrical signal in response to a selected setting of each switch;

means for sensing said generated signal;

means for comparing said sensed signal to a predetermined range of allowable signals including means for switching on an error indicia in response to an out of range signal;

an address checking circuit; and



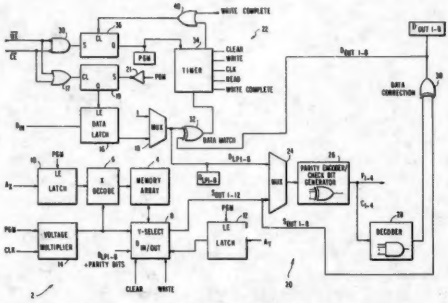
means for sensing an absence of said error indicia and for performing at least a first selected hardware error check on said address checking circuit in response thereto.

4,612,640

ERROR CHECKING AND CORRECTION CIRCUITRY FOR USE WITH AN ELECTRICALLY-PROGRAMMABLE AND ELECTRICALLY-ERASABLE MEMORY ARRAY

Sanjay Mehrotra, San Jose, and Gust Perlegos, Fremont, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed Feb. 21, 1984, Ser. No. 581,685
Int. Cl.[4] G06F *11/11*
U.S. Cl. 371—51 6 Claims



1. A circuit device for use with a semiconductor memory which can operate in a write mode, the semiconductor memory having an input section which receives data to be programmed and a memory array into which the data received by the input section can be programmed during the write mode of semiconductor memory operation and from which data can be read out after programming, the semiconductor memory responding to write and read signals for respectively writing the data into and reading the data out from the memory array, said circuit device operating to determine whether the data programmed into the memory array has been properly and completely stored and to correct errors in the data so programmed, said circuit device comprising:

parity storage means in the memory array for receiving and retaining parity information on the data being programmed into the memory array;

parity encoder means connected to the input section and the memory array of the semiconductor memory and to said parity storage means, said parity encoder means operating to generate and supply said parity storage means with a first set of parity information derived as a function of the byte pattern of the data being programmed into the memory array, said parity encoder means also operating to

generate a second set of parity information as a function of the byte patterns of the data read out from the memory array and the first set of parity information read from said parity storage means;

decoder means connected to receive both the data read out from the memory array and said second set of parity information from said parity encoder means, said decoder means operating to detect the occurance of errors in the data read out from the memory array, said decoder means also operating to generate corrected data by correcting said errors detected in the data;

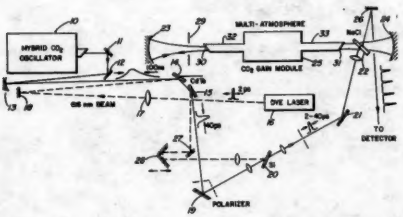
matching means for receiving both the data being programmed and said corrected data generated by said decoder means, said matching means operating to generate a match signal when said corrected data matches the data being programmed; and

timer means connected to said matching means for generating a first signal at the start of the write operation, said first signal serving as a write signal which causes the data to be programmed into the memory array, said timer means also generating a second signal at a predetermined time after said first signal is generated, said second signal serving as a read signal which causes the data programmed into the memory array and said first set of parity information supplied to said parity storage means to be read out of the memory array and sent to said parity encoder means, said timer means finally generating a third signal in response to receipt of said matching signal from said matching means, said matching signal serving to indicate that the write mode of operation of the semiconductor memory is complete.

4,612,641
INFRARED PULSE COMPRESSION

Paul B. Corkum, Gloucester, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed May 18, 1984, Ser. No. 611,952
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—25 **24 Claims**



1. A process for compressing optical pulses comprising:

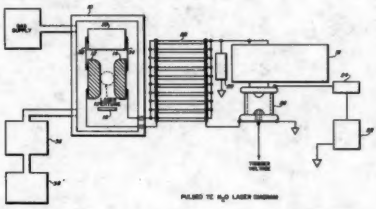
producing a plasma in a gas, semiconductor or dielectric medium,

propagating optical pulses through said medium along with said plasma production thereby resulting in amplified pulses having a blue chirp impressed on them, and propagating said amplifier and chirped pulses through a dispersing means, such that said pulses are compressed by said dispersing means.

4,612,642
OPERATION OF TRANSVERSELY EXCITED N_2O LASERS

Wayne T. Whitney, Oxon Hill, Md., and Hiroshi Hara, Funabashi, Japan, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 17, 1984, Ser. No. 651,399
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—33 **18 Claims**



1. A method of suppressing discharge arcing in a pulsed transversely excited laser operating at N_2O wavelengths, comprising:

utilizing a gas lasing medium including N_2O;

utilizing a gas additive including H_2 for said lasing medium which combines with negative oxygen ions to form neutral molecules and electrons;

combining said gas additive with said lasing medium to form a gas mixture including N_2O;

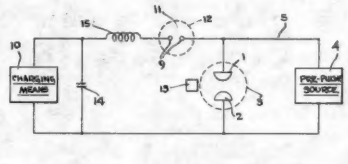
pressurizing said gas mixture in said laser; and

energizing said gas mixture in said laser to generate lasing action.

4,612,643
ELECTRIC GLOW DISCHARGE USING PREPULSE AND CHARGE STORAGE DEVICE

William H. Long, Torrance; Eddy A. Stappaerts, Rancho Palos Verdes, and Michael J. Plummer, Rollings Hills Estates, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 30, 1984, Ser. No. 575,463
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—38 **8 Claims**



1. In an apparatus for producing an electrical glow discharge in a volume of gas between first and second discharge electrodes, the gas having the properties that such an electrical glow discharge can be initiated by providindg a voltage across the two discharge electrodes greater than or equal to a predetermined firing voltage and that after the glow discharge begins the voltage across the discharge electrodes decreases to a predetermined steady-state value and remains at said value as long as the glow discharge continues, the improvement comprising

first and second electrical conductors arranged to form a transmission line and having an electrical capacitance therebetween,

charging means for transferring to the transmission line an amount of electrical charge that produces a voltage between the two transmission line conductors equal to two times said steady-state voltage of the electric glow discharge,

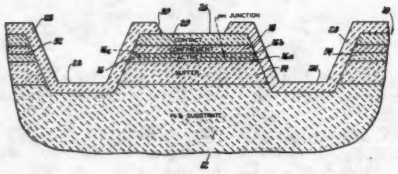
prepulse means for applying across the two discharge electrodes a prepulse voltage greater than or equal to said firing voltage for a time period long enough to initiate a glow discharge in said volume of gas,

and switch means for connecting the transmission line to the discharge electrodes after the time at which the prepulse means first applies the prepulse voltage to the discharge electrodes.

4,612,644
LEAD-ALLOY-TELLURIDE HETEROJUNCTION SEMICONDUCTOR LASER

Dale L. Partin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1985, Ser. No. 754,171
Int. Cl.[4] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—44 **3 Claims**

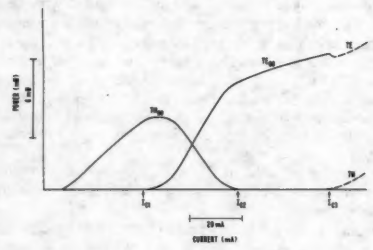


1. In a double heterojunction semiconductor lead salt infrared diode laser, the improvement wherein a semiconductive monocrystalline lead salt active region layer of given energy band gap, index of refraction, crystal structure and lattice constant is sandwiched between two semiconductive monocrystalline lead salt layers of mutually opposite conductivity type containing calcium and one element selected from the group consisting of europium and strontium and having an energy band gap significantly higher than, an index of refraction significantly lower than, a crystal structure the same as, and a lattice constant substantially equal to the active region layer, effective to increase laser performance by providing lattice matching among said layers as well as providing at least carrier confinement with respect to the active region layer.

4,612,645
FAST POLARIZATION-SWITCHABLE SEMICONDUCTOR LASERS

Jin-Ming Liu, Arlington, Mass., and Ying-Chih Chen, Closter, N.J., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 19, 1984, Ser. No. 683,776
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **3 Claims**



1. A polarization-switchable semiconductor laser device in which the output of the semiconductor laser device can be switched between a pure TE mode and a pure TM mode by varying laser injection current levels, said device comprising:

a semiconductor substrate;

a first cladding layer of semiconductor formed on the substrate;

an active layer of semiconductor formed on the first cladding layer, thereby forming a junction plane between the active layer and the first cladding layer;

a second cladding layer of semiconductor formed on the active layer; and

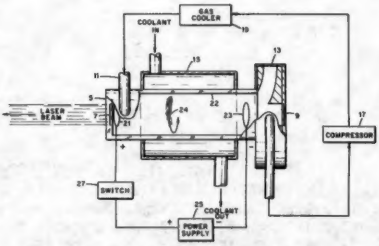
a cap layer of semiconductor formed on the second cladding layer;

said active layer having a lattice constant parallel to the junction plane sufficiently larger than the lattice constant of the active layer normal to the junction plane so as to increase the optical gain of the TM mode relative to the optical gain of the TE mode, such that at a first injection current level, the laser device operates in the TM mode and at a second injection current level, the laser device operates in the TE mode.

4,612,646
LASER UTILIZING A GASEOUS LASING MEDIUM AND METHOD FOR OPERATING THE SAME

Bruce A. Zerr, Harriman, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 18, 1983, Ser. No. 542,968
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—58 **12 Claims**



1. In a method for operating a laser wherein a gaseous medium is made to lase while passing through a laser tube, the improvement comprising:

introducing said gaseous medium tangentially into said laser tube to establish a forced vortex therein having a central core region of low pressure and temperature relative to the periphery of said vortex; and

initiating lasing of said gaseous medium in said core region.

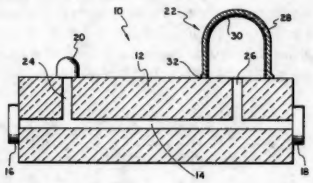
4,612,647
HIGH PERFORMANCE LASER AND METHOD OF MAKING SAME

Gordon S. Norvell, Agoura Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 517,099, Jul. 25, 1983, which is a continuation-in-part of Ser. No. 453,780, Dec. 27, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 729,071
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—88 **7 Claims**

1. In a laser of the type including a dielectric body of preselected thermal expansion characteristic material and at least

one electrode fixed thereto by the method of field-assist bonding, the improvement comprising:



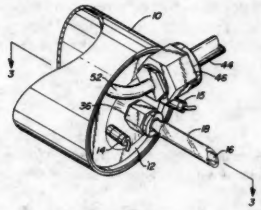
(a) said at least one electrode comprising preselected dielectric material having a thermal expansion characteristic that closely matches said body; and
(b) said at least one electrode having a metallic coating.

4,612,648

MODULAR GAS LASER END ASSEMBLY

Royal D. Peterson, Alpharetta, Ga., and Ronald E. Jones, Cupertino, Calif., assignors to Continental Laser Corporation, Mountain View, Calif.

Filed Jan. 17, 1985, Ser. No. 692,787
Int. Cl.⁴ H01S *3/00*
U.S. Cl. 372—109 **6 Claims**



1. A modular end assembly for a gas laser comprising,
a gas reservoir, mounted at an end of a gas laser tube having a support flange and a cathode,
means for replaceably mounting a Brewster angle window to the center of said flange, and
means for replaceably mounting a gas feed tube to said flange.

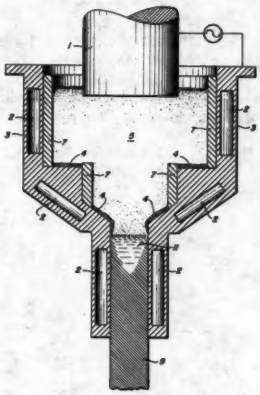
4,612,649

PROCESS FOR REFINING METAL

Arthur H. Griebel, III, Kokomo, and Richard A. Foster, Russiaville, both of Ind., assignors to Cabot Corporation, Boston, Mass.

Filed Nov. 10, 1983, Ser. No. 550,348
Int. Cl.⁴ H05B *3/60*
U.S. Cl. 373—45 **8 Claims**

1. In a process for electroslag refining metal in a crucible containing a layer of molten slag, wherein molten metal passes downwardly through said slag and resolidifies as an ingot thereunder and wherein said slag is kept molten by passing electrical current through said slag layer and between a first metallic electrode and a second metallic electrode, said second electrode being other than the resolidified ingot and having cooling means as an integral part thereof, the improvement conprising the steps of
providing at least one electrically conductive member attached to said second electrode and submerged in said molten slag then
passing substantially all of said electrical current between said first electrode and said second electrode on a path through said at least one electrically conductive member interposed between said slag and only a portion of said second electrode, said electrically conductive member having a melting temperature above the melting temperature but below the bulk temperature of said slag, and the portion of the surface of said electrically conductive member that is in contact with said slag having a temperature



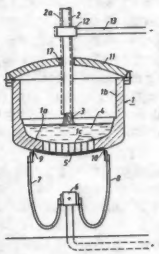
above the freezing temperature of said slag due to said member's thickness and thermal conductivity, thereby preventing the formation of a frozen slag layer thereon and arcing therethrough while avoiding passing current through said resolidified ingot.

4,612,650

DC ARC FURNACE

Sven-Einar Stenkvist, Västerås, Sweden, assignor to Asea AB, Västerås, Sweden

Filed Apr. 4, 1985, Ser. No. 719,965
Claims priority, application Sweden, Apr. 16, 1984, 8402101
Int. Cl.⁴ H05B *7/00*
U.S. Cl. 373—108 **1 Claim**



1. A DC arc furnace comprising a furnace vessel having a hearth and a side wall extending upwardly from the hearth, conductive means for conducting DC through the hearth from its outside to a melt in the hearth, one arcing electrode, a substantially horizontal arm having a holder holding the electrode substantially vertically above the hearth, a substantially vertical mast from which the arm extends, and means for connecting DC positively to the conductive means and negatively to the electrode so as to form an arc between the electrode and the melt and producing an arc flare to which the side wall is exposed; wherein the improvement comprises means for connecting the arm to the mast so as to permit the arm to be

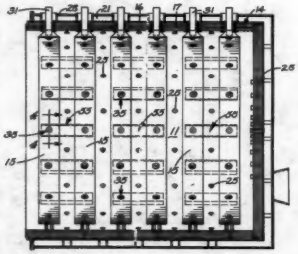
adjustably moved longitudinally to different positions thus moving the arcing electrode parallel to itself into different positions in relation to the side wall and means for mounting the mast so it can be adjustably rotated to different positions about its axis, whereby the electrode and its arc can be located at different positions horizontally to the side wall.

4,612,651

HEAT TREATING FURNACE WITH HEATING ELEMENT HANGERS AND RADIATION SHIELD SPACERS

Craig A. Moller, Loves Park, and Eric H. Wolter, Cherry Valley, both of Ill., assignors to Abar Ipsen Industries, Feasterville, Pa.

Filed May 24, 1984, Ser. No. 613,281
Int. Cl.[4] F27B *5/04*
U.S. Cl. 373—130 **12 Claims**



1. A heat treating furnace comprising wall means defining a work chamber, electric resistance heating elements disposed inside of said chamber for heating workpieces therein, and means for attaching said heating elements to said wall means, said furnace being characterized in that each of said attaching means comprises a threaded nut having an outer end bonded rigidly to the inner side of said wall means, said wall means being imperforate in that area of the wall means directly opposing the entirety of the outer side of said nut, an elongated hanger rod having an outer end portion threaded into said nut and terminating short of the outer side of said wall means, and means for connecting a heating element to and insulating the heating element electrically from the inner end portion of said hanger rod, said wall means comprising an innermost radiation shield spaced outwardly from said heating element, said connecting and insulating means comprising a ceramic tube having an outer end abutting said shield and having an inner end portion extending through a hole in said heating element, the inner end portion of said hanger rod also extending through said hole, said ceramic tube being telescoped over said hanger rod and insulating the inner end portion of said hanger rod from said heating element, a ceramic washer telescoped over the inner end portion of said ceramic tub and abutting the inner side of said heating element adjacent said hole, a retaining washer telescoped over the inner end portion of said hanger rod and covering the inner side of said ceramic washer, said retaining washer being insulated from said heating element by said ceramic washer, and means for captivating said retaining washer on the inner end portion of said hanger rod.

4,612,652

FREQUENCY HOPPING DATA COMMUNICATION SYSTEM

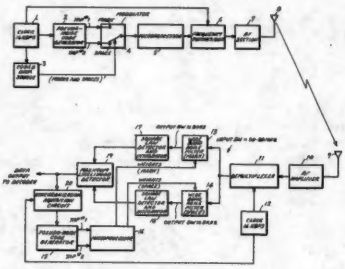
Joseph Kadin, Florham Park, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,924
Int. Cl.[4] H04L *25/26*; H04B *15/00*
U.S. Cl. 375—1 **14 Claims**

7. A frequency hopping data communication transmitter for transmitting binary data having a random location of mark and space frequencies over a transmission bandwidth, comprising:

first means responsive to a clock signal having a predetermined bit rate to produce identical first and second pseudo-noise code streams time displaced with respect to each other; and

second means coupled to said first means, said second means being responsive to binary data signals having said predeter-



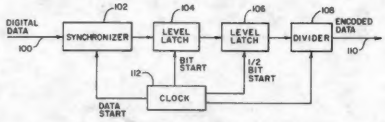
mined bit rate and said first and second code streams to provide a modulated signal for conveying said data signals, said modulated signal having different randomly occurring frequenices representing both binary conditions of said data signals and random spacing between said randomly occurring frequencies representing each of said binary conditions of said data signals such that mark and space frequencies are frequency hopped independently.

4,612,653

DELAY MODULATION PHASE CODING

William D. Livingston, Falls Church, and Wayne A. Mack, Springfield, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 21, 1983, Ser. No. 459,899
Int. Cl.[4] H03K *1/16*
U.S. Cl. 375—23 **1 Claim**



1. Apparatus for encoding digital data transmitted among at least three communicating devices wherein said communicating devices share a plurality of transmission media, comprising:

(a) synchronizing means to add a synchronization signal to the beginning of said digital data thereby to provide a modified digital data signal;

(b) first latching means responsive to said modified digital data for providing a binary signal for a predetermined duration in accordance with the level of said modified digital data at the beginning of each said predetermined duration;

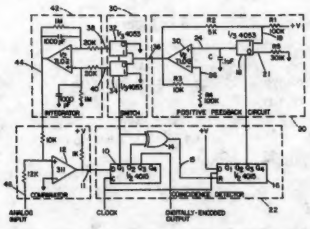
(c) second latching means responsive to said binary signal for providing a delayed modulated signal for a duration of one-half said predetermined duration in accordance with the level of said binary signal at the beginning of each one-half predetermined duration interval; and

(d) dividing means responsive to said delayed modulated signal for expanding the duration of each said delayed modulated signal to said predetermined duration to thereby encode the digital data.

4,612,654
DIGITAL ENCODING CIRCUITRY

Richard E. DeFreitas, North Chelmsford, Mass., assignor to Analog and Digital Systems, Inc., Wilmington, Mass.

Filed Aug. 27, 1984, Ser. No. 644,340
Int. Cl.[4] H03M *3/02*; H04B *14/06*
U.S. Cl. 375—30 **15 Claims**



1. An electrical system comprising means for generating a digitally-encoded signal with high and low states, wherein said digitally-encoded signal is determined at least in part by the difference between a present value of an input signal and a reconstructed signal representative of a past value of said input signal, and wherein the state of said digitally-encoded signal is redetermined at a clock frequency,

increment-adjusting means for providing that the occurrence of a high or a low state in said digitally-encoded signal corresponds to an incremental change in said input signal of an amount dependent upon a reference signal determined from said digitally-encoded signal, and

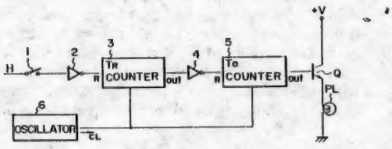
reference-signal-generating means including means for increasing the value of said reference signal upon detection of one or more consecutive repetitions of the same digital state in said digitally-encoded signal and decreasing said value upon detection of an end to said repetitions,

wherein said increases in said reference signal are provided primarily by a clock-independent circuit, said circuit including means for increasing said reference signal at a rate independent of said clock frequency.

4,612,655
DRIVING TIME ALARM FOR VEHICLE

Koichi Nakamura, 1-9-2, Shinyashiki, Kochi-Shi, Kochi-Ken, Japan

Filed Apr. 5, 1984, Ser. No. 597,468
Claims priority, application Japan, Apr. 18, 1983, 58-68191
Int. Cl.[4] G07C *5/02*
U.S. Cl. 377—16 **14 Claims**



1. A driving time alarm for a vehicle, comprising:

an oscillator for generating clock pulses; a driving time limit setting counter connected to said oscillator, which driving time counter starts to count said clock pulses by detecting a start of driving;

a recess time setting counter connected to said oscillator, which recess time counter starts to count said clock pulses by detecting a stop of driving;

means for generating an alarm by detecting that the count value of said driving time limit setting counter reaches a first preset value after the start of counting operation thereof;

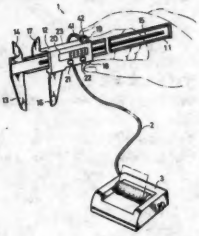
means for stopping the operation of said alarm generating means by detecting that the count value of said recess time setting counter reaches a second preset value after the start of counting operation thereof; and

means for making said driving time limit setting counter continue to count if the driving of said vehicle starts before the count value of said recess time setting counter reaches said second preset value after the start of counting operation thereof.

4,612,656
DIGITAL INDICATION TYPE MEASURING APPARATUS

Mikio Suzuki, and Toshiyuki Matsumoto, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,893
Claims priority, application Japan, Feb. 16, 1983, 58-21108[U]
Int. Cl.[4] G01B *3/20*
U.S. Cl. 377—24 **5 Claims**



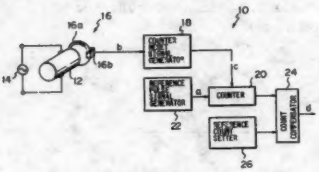
1. In a digital indication type measuring instrument which is compact in size and is portable, said measuring instrument having scale means and a slider means movably mounted on said scale means, a data processing circuit means and a digital display means provided on said slider means and movable therewith, the improvement comprising wherein said slider means has a body and an electrical jack means connected in electrical circuit to said data processing circuit means; and wherein a connector means is adapted to be detachably mounted on said electrical jack means, said connector means including an elongated cable and a body part secured to one end of said cable, the other end of said cable being connected in circuit with a recording means separate from said scale means and said slider means, said body part having a data output switch means thereon easily operable by a finger of a user of said measuring instrument for providing a data output command to said data processing circuit means upon operation thereof to effect the selected transference of data in said data processing circuit means and displayed on said digital display means to said recording means, a removal of said body part and said data output switch means thereon from said electrical jack means for purposes of detaching said recording means from connection with said data processing circuit means still enabling a reading of said data in said data processing circuit means on said digital display means.

4,612,657

DEVICE FOR DETECTING MOMENTARY CUTOFF OF AC POWER SOURCE

Harumi Takahashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,064
Claims priority, application Japan, Apr. 19, 1983, 58-68834
Int. Cl.[4] G05B *1/03*
U.S. Cl. 377—32 **3 Claims**



1. A device for protecting data by detecting a momentary cutoff of AC power to a data processing unit from an AC power source, comprising:

a synchronous motor which is rotatably energized by the AC power source;

speed sensor means for sensing a rotation speed of the synchronous motor; and

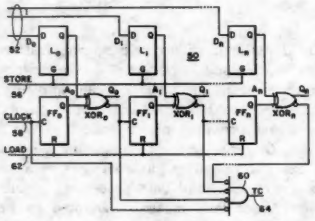
decision means for detecting a rotation speed which is sensed by said speed sensor means and determining that the AC power source is in a momentary cutoff when the detected rotation speed is lower than the predetermined rotation speed by a predetermined amount so that no loss of said data occurs.

4,612,658

PROGRAMMABLE RIPPLE COUNTER HAVING EXCLUSIVE OR GATES

David H. Eby, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 29, 1984, Ser. No. 584,696
Int. Cl.[4] G06M *3/02*; H03K *19/21*
U.S. Cl. 377—52 **16 Claims**



1. A counter circuit, comprising:

first register means for storing a predetermined number representing a quantity of pulses to be counted,

means for counting a series of pulses received therein from an external source, said counting means including second means for storing the counted pulses, the second storing means including means responsive to a reference timing signal received from another external source for resetting the second storing means to an initial count, said counting means including means for asynchronously coupling in series elements of the second storing means to propogate the count therethrough, the coupling means being coupled to the first mentioned storing means so as to receive the predetermined number from the first mentioned storing means, the coupling means generating a logical combination of the predetermined number and the instantaneous count stored in the second storing means, said second storing means storing a terminal count when the predetermined quantity of pulses has been counted; and

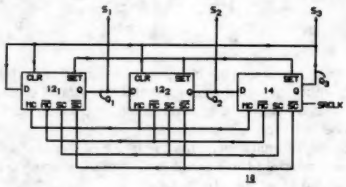
means coupled to said counting means for decoding the terminal count, said decoding means including means for generating a terminal count signal for use by an external device.

4,612,659

CMOS DYNAMIC CIRCULATING-ONE SHIFT REGISTER

Richard J. Starke, Temple, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1984, Ser. No. 629,809
Int. Cl.[4] G11C *19/00*
U.S. Cl. 377—72 **8 Claims**



1. A dynamic, circulating-one N-stage shift register (**10**) for circulating a plurality of N-1 logic zeroes and a single logic one through the N stages, said shift register comprising

a plurality of N−1 shift register cells, (12_1–12_{N-1}), each cell comprising a D input, a Q output, a Clear input, and a Set output, said plurality of N−1 shift register cells sequentially disposed such that the Q output of a first shift register cell (Q1) is connected to the D input of a second shift register cell (D2), and continuing in a like manner where the Q output of the N−2nd shift register cell (Q_{N-2}) is connected to the D input of the N−1st shift register cell, for passing the value appearing at the associated D input to the associated Q output at the completion of both a master clock (MC) phase and a slave clock (SC) phase, where said master clock and said slave clock phases are non-overlapping; and

a shift register control cell (**14**) comprising a D input, a Q output, and control means, wherein the Q output from the N−1st shift register cell (Q_{N-1}) is connected to the D input of said control cell and the Q output from said control cell is connected to both the D input of the first shift register cell (D1) and the pluarlity of N−1 Clear inputs of said plurality of N−1 shift register cells for clearing the Q output of each shift register cell to the value of logic zero when the Q output of said shift register control cell (Q_N) is equal to a logic one, said shift register control cell control means responsive to the plurality of N−1 Set outputs from said plurality of N−1 shift register cells for providing a Q output from said control cell equal to a logic one when the plurality of N−1 Q outputs from said plurality of N−1 shift register cells are all equal to a logic zero.

4,612,660

TIME RESOLVED EXTENDED X-RAY ABSORPTION FINE STRUCTURE SPECTROMETER

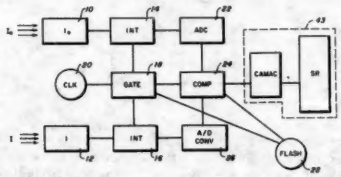
Huey W. Huang, Houston, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1985, Ser. No. 734,986
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—44 **4 Claims**

1. An X-ray spectrometer for obtaining EXAFS data from a target material comprising:

a means for detecting EXAFS data of a target material exposed to a pulsed synchrotron radiation having a selected spectrum and intensity suitable for obtaining EXAFS data from the material, and

a means for processing said detection data, said means for



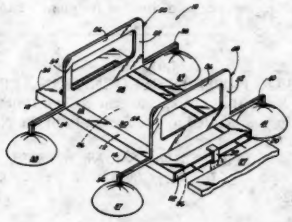
processing comprising an integration means for measuring intensity of X-ray in such a way that maximizes the signal to noise ratio of the measurement, and a gating means for determining the time interval of integration and for synchronizing the starting time of integration with the pulses of synchrotron radiation.

4,612,661

SUCTION ENGAGING X-RAY CASSETTE CONTAINER

Donald W. Dallas, 641 Grovewood Dr., Gretna, La. 70053

Filed Mar. 30, 1984, Ser. No. 595,417
Int. Cl.[4] G02B 5/00
U.S. Cl. 378—177 **8 Claims**



1. A container for housing radiographic film cassette comprising:

a. a container portion, having top, bottom and side wall portions, defining a cassette receiving space therein, said container portion having a first end movable between opened and closed positions; and

b. suction means adapted to said container portion for suctionally adhering said container to the surface to be x-rayed.

4,612,662

CONTROL CIRCUIT

Takeshi Kuwajima, and Kiyoshi Amazawa, both of Tokyo, Japan, assignors to NEC Corporation and Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,124
Claims priority, application Japan, Sep. 2, 1983, 58-162379
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—10 **4 Claims**

1. A control circuit which comprises:

means for supplying frequency-modulated intermediate frequency detection outputs including high band noise components and FM composite signals;

active filter means to select and output said high band noise components in said frequency-modulated intermediate frequency detection outputs, said active filter means having a feedback terminal;

first amplifier to amplify the output from said active filter means;

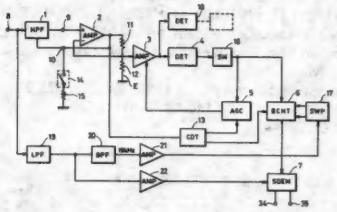
level detection means to detect the level of said high band noise in the output from said first amplifier;

smoothing means to smooth the output from said level detection means;

first control means responsive to the output from said smoothing means to control the gain attenuation of said first amplifier;

a stereo demodulation circuit;

means to select said FM composite signals in said intermediate frequency detection output and apply them to said stereo demodulation circuit;



second control means responsive to the output from said smoothing means to control the separation ratio of the FM stereo demodulation output from said stereo demodulation circuit into right and left stereo channels, there being a threshold level at which said separation ratio begins to vary; and

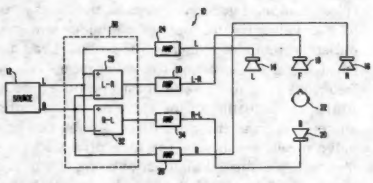
current detection means responsive to the current flowing into a resistor connected between said feedback terminal of said active filter means and a reference potential point to control said second control means so as to change said level at which said separation ratio begins to vary.

4,612,663

MULTICHANNEL AUDIO REPRODUCTION SYSTEM

Kyle A. Holbrook, and Michael J. Yacavone, both of P.O. Box 135 University Station, Syracuse, N.Y. 13210

Filed Mar. 26, 1984, Ser. No. 593,260
Int. Cl.[4] H04R 5/00
U.S. Cl. 381—24 **16 Claims**



1. A multichannel reproduction system for a source producting left (L) and right (R) signals, comprising:

four speakers arranged in a T-configuration, the speaker at the top left portion of the "T" being the left speaker, the speaker at the top right portion being the right speaker, the speaker at the top center portion being the front speaker, and the speaker at the bottom portion being the back speaker,

said left, front and right speakers being disposed in a first common vertical plane, and said front and back speakers being disposed in a second common vertical plane perpendicular to said first common vertical plane;

first means coupled to the source and to the left speaker for delivering the L signal to said left speaker;

second means coupled to the source and to the right speaker for delivering the R signal to said right speaker;

third means coupled to the source and to one of said front speaker or said back speaker for delivering to said one speaker a signal equal to the L signal minus the R signal; and

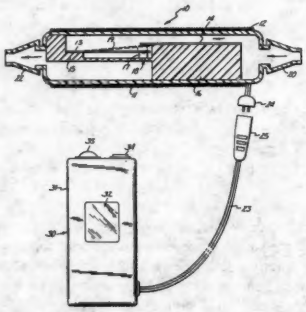
fourth means coupled to the source and to the other one of said front speaker or said bakc speaker for delivering to said other one speaker a signal equal to the R signal minus the L signal.

4,612,664

ARTIFICIAL SPEECH AID TONE GENERATING DEVICE

John J. Walsh, La Crescent, and Michael W. Walsh, Shoreview, both of Minn., assignors to Dacomed Corporation, Minneapolis, Minn.

Filed Apr. 22, 1985, Ser. No. 725,946
Int. Cl.[4] A61F *1/20*
U.S. Cl. 381—70 5 Claims



1. An improved tone generator, for producing an artificial vocal tone, the tone suitable for delivery to a user's oral cavity by a tone delivery means enabling the user to articulate the tone into speech, which tone generator comprises:

(a) solenoid reed valve means, for producing the tone and for regulating a flow of pressurized air through the valve means, the valve means having an inlet end connecting with a pressurized air source, and an outlet end connecting with the tone delivery means; and

(b) electrical pulse generating means, electrically connected to the valve means, the generating means containing pulsed current circuit means, for producing a pulsed electrical signal for actuating the valve means at a sufficient frequency so that the valve means produces the tone, and so that the actuating of the valve permits the pressurized air to flow from the pressurized air source through the valve means amplifying the tone produced therein, the tone and pressurized air then entering the tone delivery means for delivery of the tone to the user's oral cavity wherein the tone is articulated into speech by the user.

4,612,665

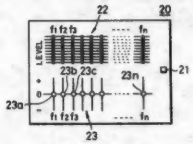
GRAPHIC EQUALIZER WITH SPECTRUM ANALYZER AND SYSTEM THEREOF

Mamoru Inami, and Yoshiaki Tanaka, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 68,476, Aug. 20, 1979, abandoned. This application Oct. 23, 1981, Ser. No. 314,360
Claims priority, application Japan, Aug. 21, 1978, 53-114525[U]
Int. Cl.[4] G01R *23/18;* H03G *5/02;* H04B *3/04*
U.S. Cl. 381—98 11 Claims

1. A graphic equalizer comprising:

(a) a first equalizer for separately level adjusting a first input signal for each of a number of divided frequency bands, producing a first output signal, said divided frequency bands being different from each other;



(b) control means, one for each of said divided frequency bands, for carrying out level adjusting of said first equalizer;

(c) control knobs provided one for each of said divided frequency bands for manually controlling said control means;

(d) a spectrum analyzer having a display section for separately displaying said first output signal for each of a number of divided frequency bands, wherein said divided frequency bands are the same frequency bands for which said first input signal is level adjusted in said first equalizer; and

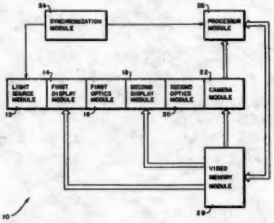
(e) a casing provided with a panel face having said control knobs and said display section of said spectrum analyzer and accommodating said first equalizer and said spectrum analyzer therein, said control knobs being positioned on said panel face in correspondence with said display section for each of said divided frequency bands.

4,612,666

AUTOMATIC PATTERN RECOGNITION APPARATUS

William J. King, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1984, Ser. No. 627,939
Int. Cl.[4] G06K *9/74*
U.S. Cl. 382—32 9 Claims



1. An automatic pattern recognition apparatus for detecting and identifying electronic signal patterns transmitted thereto comprising:

a first light source module being configured to convert a video signal to a corresponding optical image;

a first display module operatively connected to said first light source, said first display module being configured so as to imprint information of shades of gray, polarization and color on the optical image passing therethrough from said first light source;

a second display module;

a first optics module operatively connected between said first display module and said second display module, said first optics module being configured so as to direct the optical image passing therethrough to said second display module, and said second display module being configured so as to imprint information of shades of gray, polarization and color on the optical image passing therethrough;

a camera module; and

a second optics module operatively connected between said

second display module and said camera module, said second optics module being configured so as to direct the optical image passing therethrough to said camera module, and said camera module being configured so as to detect the presence of the optical image thereat and convert it to a corresponding video signal.

4,612,667

EMERGENCY TRANSMITTER AND METHOD OF OPERATING THE SAME

Holger Hansen, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

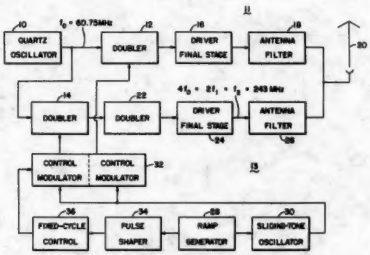
PCT No. PCT/DE83/00007, § 371 Date Sep. 22, 1983, § 102(e) Date Sep. 22, 1983, PCT Pub. No. WO83/02699, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 19, 1983, Ser. No. 552,051

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201845

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—98 **11 Claims**



1. An emergency transmitter accommodated in a floatable housing and including a first transmission means for transmitting a first frequency, and a second transmission means for transmitting a second frequency different from the first frequency, with said first and second transmission means being connectable via a switch to a battery; said emergency transmitter further comprising:

a quartz oscillator in common for both of said transmission means;

respective frequency multiplying means, for each of said transmission means, connected to said quartz oscillator;

respective driver and high frequency final stages, for each of said transmission means, connected to said frequency multiplying means;

a transmission antenna which projects out of said housing and to which said driver and high frequency final stages are connected;

respective antenna filters which are interposed between said transmission antenna in common therewith and the outputs of the respective final stages, and insulate the latter from one another;

fixed-cycle control means operatively associated respectively with said first and second transmission means accommodated in common in the floatable housing and arranged for alternately setting said first and second transmission means into operation;

a fixed-cycle signal generator including a ramp signal generator and a pulse shaper operatively connected therewith, said fixed-cycle control means being responsive to an output of said pulse shaper; and

a sliding tone frequency oscillator which is connected to said ramp signal generator and the frequency of which can be controlled, with the tone frequency of said sliding tone frequency oscillator changing as a function of the ramp signal; said sliding tone frequency oscillator being provided with means for modulation of at least one of said transmission means.

4,612,668

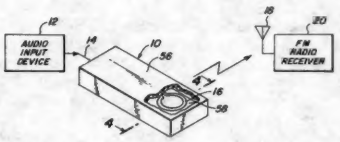
FM WIRELESS TRANSMITTER

Vinko Sarac, 114 Richbell Rd., Apt. 4-B, Mamaroneck, N.Y. 10543

Filed Jul. 23, 1984, Ser. No. 633,482

Int. Cl.[4] H04B *1/34, 1/03, 1/04*

U.S. Cl. 455—120 **3 Claims**



1. An FM wireless transmitter, comprising in combination:

(a) an electronic oscillator mounted to a printed circuit board;

(b) a printed circuit inductances which is part of the frequency determining reactance of an LC circuit and also serves as a radiating antenna;

(c) a metal plate in close proximity to said printed circuit board;

(d) said metal plate attached to a case which surrounds said printed circuit board and forming a capacitance with said LC circuit, where said plate is exchangeable with other plates of varied surface area and casing is interchangeable with other casings having different dimensioned plates attached therein to change the capacitance to thereby vary the resonant frequency of said LC circuit;

(e) an audio input which modulates the frequency of said oscillator, thereby producing a frequency modulated signal; and

(f) a power source for said oscillator.

4,612,669

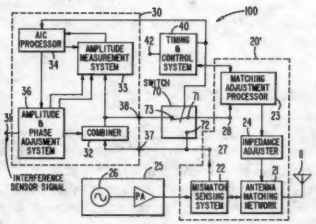
ANTENNA MATCHING SYSTEM

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1985, Ser. No. 729,164

Int. Cl.[4] H04B *1/02;* H03G *11/04*

U.S. Cl. 455—123 **7 Claims**



1. In a system for adjusting the impedance of an antenna matching network to match an antenna at a desired carrier frequency in which said system is of the type including said antenna matching network, means for adjusting the impedance of said matching network, means for providing a mismatch signal representative of the condition of said matching network during the transmission of a tuning signal therethrough and a matching adjustment processor responsive to said mismatch signal for controlling said means for adjusting, the improvement for cancelling from said mismatch signal an interfering signal having a different frequency than said tuning signal, comprising:

means for providing an interference sensor signal having the frequency of said interfering signal;

means responsive to said interference sensor signal and phase and amplitude control signals for providing a modified interference sensor signal having a phase and amplitude determined by said control signals;

means for combining said modified interference sensor signal and said mismatch signal to provide a modified mismatch signal;

an adaptive interference cancellation (AIC) processing system responsive to said modified mismatch signal for providing said phase and amplitude control signals of values that reduce the amplitude of said interfering signal in said modified mismatch signal relative to its amplitude in said mismatch signal; and

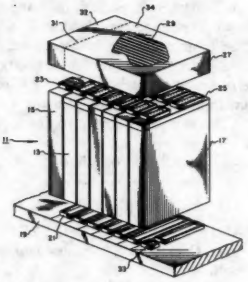
means for coupling said modified mismatch signal to said adjustment processor.

4,612,670

ELECTRO-OPTICAL CONNECTION BETWEEN ELECTRONIC MODULES

J. Kirston Henderson, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed May 16, 1984, Ser. No. 610,764
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—607 **5 Claims**



1. An apparatus for communicating parallel digital electronic data between a plurality of electronic modules carried parallel to each other in a cluster, each module having a set of digital electrical data bus lines, the apparatus comprising in combination:

a parallel digital data bus block mounted across the cluster of modules;

a plurality of parallel digital electrical data bus lines contained in the data bus block;

a plurality of light emitting means, each mounted along a common side of each module for transmitting light pulses in response to corresponding electrical signals provided from the data bus lines within each module;

a plurality of light receiving means mounted along one side of the data bus block, each aligned with one of the light emitting means in one of the modules, for receiving light pulses from the aligned light emitting means in each module in the cluster and for producing a corresponding electrical signal for each light pulse in one of the data bus lines of the data bus block;

a plurality of light emitting means mounted along one side of the data bus block, each mounted adjacent to and paired with one of the light receiving means within the data bus block, for transmitting light pulses in response to corresponding electrical signals received from one of the data bus lines of the data bus block, which were provided by one of the light receiving means of the data bus block; and

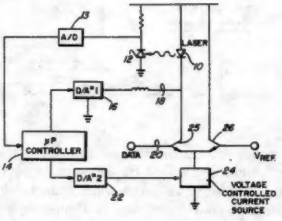
a plurality of light receiving means, each mounted along a common side of each of the modules and mounted adjacent to and paired with one of the light emitting means of the module, for receiving light pulses from an aligned light emitting means of the data bus block and for producing corresponding electrical signals in one of the data bus lines within the module.

4,612,671

LASER TRANSMITTER

Clinton R. Giles, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1984, Ser. No. 666,155
Int. Cl.[4] H01S *3/00*; H04B *9/00*
U.S. Cl. 455—609 **9 Claims**



1. A laser controller for use in a digital transmission system, the controller comprising:

means for applying a bias current to the laser;

means for increasing the bias current from a low value below laser threshold to a high value above laser threshold;

means for applying a digital data stream to the laser;

means for monitoring laser light output power;

means for storing monitored light output data (L) as a function of bias current data (I);

means for processing the stored data:

(i) to derive a second derivative d^2L/dI^2 of the L-I curve;

(ii) to find first and second peaks in the derivative, the first peak at a bias current I_1th corresponding to a lowest bias current at which digital '1' but not '0' produces lasing and the second peak corresponding to the lowest bias current I_0th at which digital '0' produces lasing; and

means for setting the bias current at or close to I_0th.

DESIGN PATENTS

GRANTED SEP. 16, 1986

ERRATA

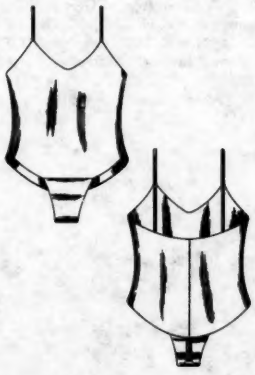
For CLASS	See PATENT NO.
D22–109	285,712
D23–017	285,713
D23–018	285,714

DESIGNS

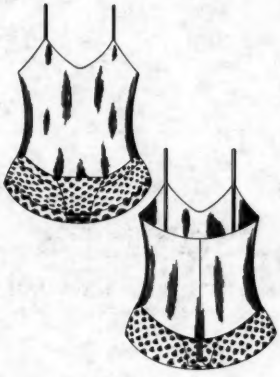
SEPTEMBER 16, 1986

285,620
ICE CREAM SANDWICH
Alan S. Drazen, Langhorne, Pa., assignor to Simco Sales Service of Pennsylvania, Inc., Philadelphia, Pa.
Filed Sep. 12, 1983, Ser. No. 531,112
Term of patent 14 years
U.S. Cl. D1—101

285,621
LADY'S LINGERIE OR SIMILAR ARTICLE
Lynne Greene, 3 Gaines Rd., Montville, N.J. 07045
Filed Jan. 19, 1984, Ser. No. 571,994
Term of patent 14 years
U.S. Cl. D2—7

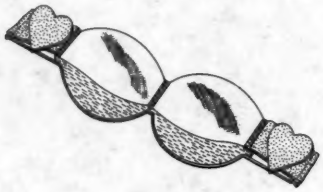


285,622
LADY'S LINGERIE OR SIMILAR ARTICLE
Lynne Greene, 3 Gaines Rd., Montville, N.J. 07045
Filed Jan. 19, 1984, Ser. No. 572,230
Term of patent 14 years
U.S. Cl. D2—7

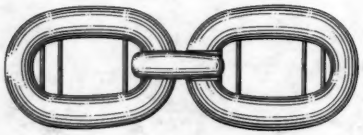


285,623
PERSONNEL EVACUATION BODY HARNESS
William E. Forrest, Denver, Colo., assignor to Advanced Evanation Systems, Inc., Denver, Colo.
Filed Feb. 22, 1984, Ser. No. 582,269
Term of patent 14 years
U.S. Cl. D2—27

285,624
PHOTOTHERAPY EYE LIGHT SHIELD
Richard J. Rosenbaum, Littleton, Colo., assignor to Rocky Mountain Medical Corporation, Greenwood Village, Colo.
Filed Apr. 9, 1984, Ser. No. 598,446
Term of patent 14 years
U.S. Cl. D2—234

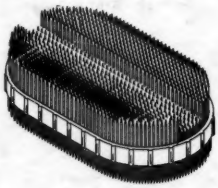


285,625
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 14, 1984, Ser. No. 681,923
Term of patent 14 years
U.S. Cl. D2—422

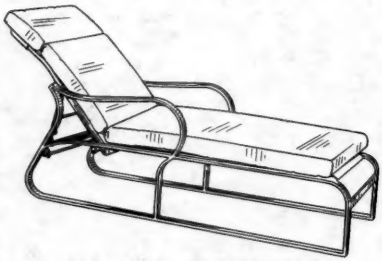


285,626
SUITCASE OR SIMILAR ARTICLE
Fu-Cheng Yen, 55, Tung Hu Rd., Ta Li Hsiang, Tai Chung Hsien, Taiwan
Filed Jan. 10, 1984, Ser. No. 569,581
Term of patent 14 years
U.S. Cl. D3—76

285,627
SURGICAL SCRUB BRUSH
Dale H. Ballard, Salt Lake City, Utah, assignor to Ballard Medical Products, Midvale, Utah
Filed Jun. 21, 1984, Ser. No. 622,920
Term of patent 14 years
U.S. Cl. D4—120



285,628
CHAISE LOUNGE
Colman Zola, 58 Tamarack Way, Pleasantville, N.Y. 10570
Filed Nov. 22, 1983, Ser. No. 554,619
Term of patent 14 years
U.S. Cl. D6—361

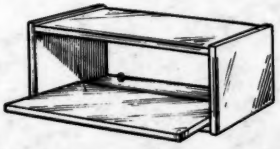


285,629
ARM-CHAIR
Klaus Franck, Hanover, and Werner Sauer, Wennigsen, both of Fed. Rep. of Germany, assignors to Wilkhahn Wilkening & Hahne GmbH & Co., Fed. Rep. of Germany
Continuation-in-part of Ser. No. 313,330, Oct. 20, 1981. This application Nov. 4, 1983, Ser. No. 548,577
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 17 MR 936
Term of patent 14 years
U.S. Cl. D6—366

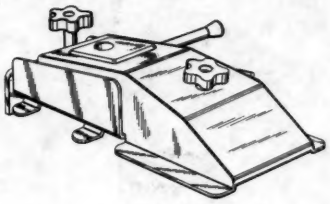
285,630
ADJUSTABLE LOUNGE CHAIR
Rodrigo Rodriquez, Carimate, Italy, assignor to Cassina S.p.A., Milan, Italy
Filed Mar. 9, 1984, Ser. No. 587,932
Claims priority, application Italy, Sep. 9, 1983, 22896/83[U]
Term of patent 14 years
U.S. Cl. D6—367

285,631
INFANT'S CRIB
Loretto Pali, Udine, Italy, assignor to J & G Importing Inc., Hauppauge, N.Y.
Filed Apr. 27, 1984, Ser. No. 604,770
Term of patent 14 years
U.S. Cl. D6—390

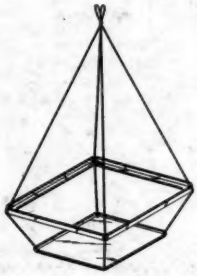
285,632
VIDEO STAND
Frans L. Axhamre, N. Krokslättsgatan 12, S-412 64 Göteborg, Sweden
Filed Mar. 8, 1983, Ser. No. 473,329
Claims priority, application Sweden, Jan. 5, 1983, 83-0029
Term of patent 14 years
U.S. Cl. D6—474



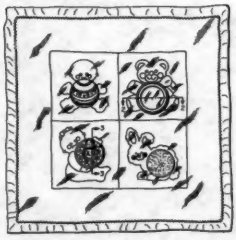
285,633
CHAIR CONTROL
Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada N2M 2Y7
Filed Mar. 5, 1984, Ser. No. 586,541
Claims priority, application Canada, Feb. 29, 1984, 29-02-84-10
Term of patent 14 years
U.S. Cl. D6—500



285,634
HANGING CARRIER
Ken J. McBean, 204 - 2090 Comox Street, Vancouver, British Columbia, Canada V6G 1R9
Filed Nov. 23, 1984, Ser. No. 674,293
Term of patent 14 years
U.S. Cl. D6—513



285,635
QUILT
Claire M. Marschak, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,490
Term of patent 14 years
U.S. Cl. D6—603



285,636

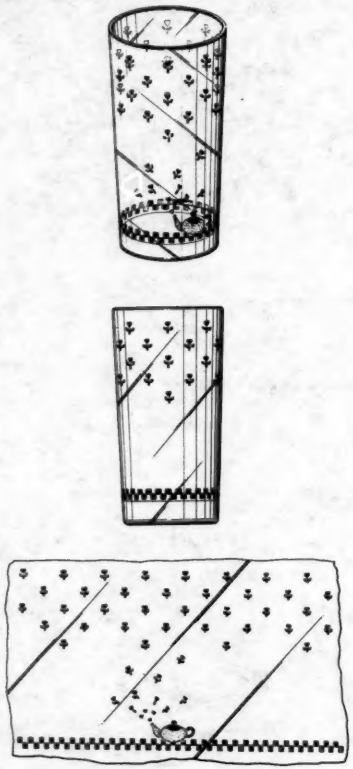
TUMBLER OR SIMILAR ARTICLE

Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 464,750, Feb. 7, 1983. This application May 3, 1985, Ser. No. 730,084

Term of patent 14 years

U.S. Cl. D7—6



285,637

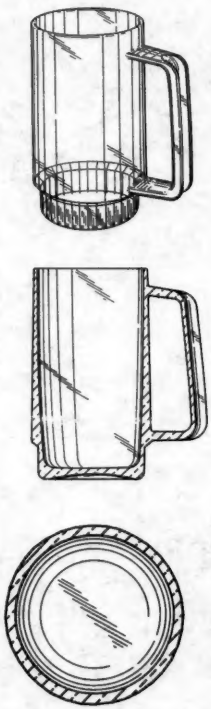
MUG OR THE LIKE

Mark P. Zieff, Lexington, Mass., and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.

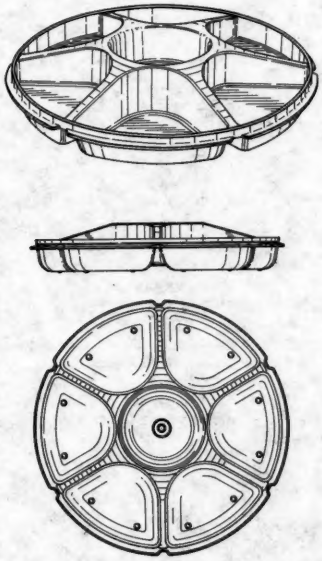
Filed Sep. 29, 1983, Ser. No. 537,875

Term of patent 14 years

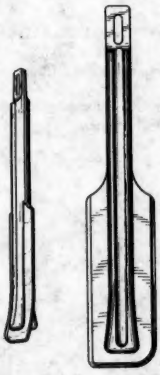
U.S. Cl. D7—9



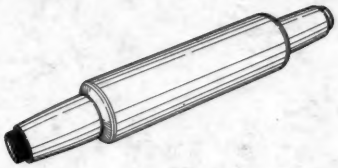
285,638
FOOD SERVING TRAY OR THE LIKE
Jody A. Trivison, Wooster, Ohio, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 29, 1983, Ser. No. 537,872
Term of patent 14 years
U.S. Cl. D7—27



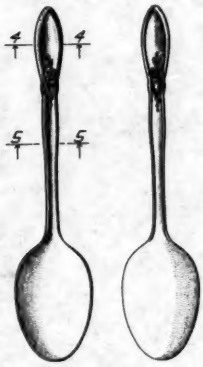
285,639
SCRAPING DEVICE
Gary Brabeck, Arlington Heights; Bruce Cohen; James Cohen, both of Chicago; Robert Kleckauskas, Downers Grove, and Robert Podall, Chicago, all of Ill., assignors to Arrow Plastic Manufacturing Co., Chicago, Ill.
Filed Feb. 23, 1984, Ser. No. 582,905
Term of patent 14 years
U.S. Cl. D7—99



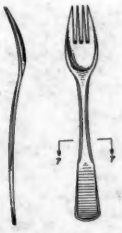
285,640
ROLLING PIN OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries, Northbrook, Ill.
Filed Jun. 6, 1983, Ser. No. 501,349
Term of patent 14 years
U.S. Cl. D7—99



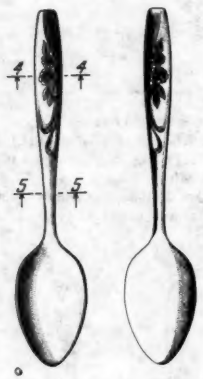
285,641
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Oct. 3, 1984, Ser. No. 657,430
Term of patent 14 years
U.S. Cl. D7—137



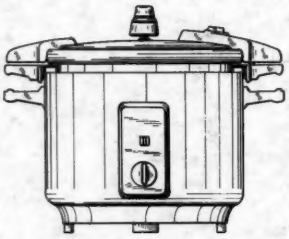
285,642
ARTICLE OF FLATWARE
Horst Schultz, Frankfurt, Fed. Rep. of Germany, assignor to AMC International ALFA Metalcraft Corporation, Fed. Rep. of Germany
Filed Dec. 15, 1983, Ser. No. 561,634
Term of patent 14 years
U.S. Cl. D7—137



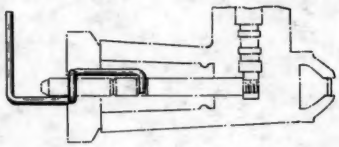
285,643
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Sherrill, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Oct. 3, 1984, Ser. No. 657,429
Term of patent 14 years
U.S. Cl. D7—150



285,644
PRESSURE COOKER
Jyoji Kitakaze, and Yoshio Oka, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Oct. 27, 1983, Ser. No. 545,950
Claims priority, application Japan, Apr. 30, 1983, 53-18509
Term of patent 14 years
U.S. Cl. D7—358

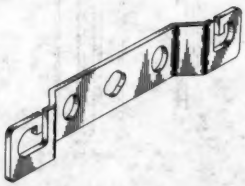


285,645
CYLINDRICAL PIN WRENCH
Peter J. Fratta, 11904 Crown Dr., Dunkirk, Md. 20754
Filed Aug. 22, 1983, Ser. No. 525,276
Term of patent 14 years
U.S. Cl. D8—21



285,646
COMBINATION PULLEY AND WEIGHT ANCHOR DEVICE
Richard F. Hahn, 1428 Gentian Dr., S.E., Kentwood, Mich. 49508, and John P. Soby, 7730 Leonard, N.E., Ada, Mich. 49301
Filed Dec. 20, 1984, Ser. No. 684,255
Term of patent 14 years
U.S. Cl. D8—360

285,647
DROP CLAMP SUSPENSION BRACKET OR SIMILAR ARTICLE
Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Apr. 27, 1984, Ser. No. 604,583
Term of patent 14 years
U.S. Cl. D8—356



285,648

COMBINED GUTTER SUPPORT AND JOINTING BRACKET

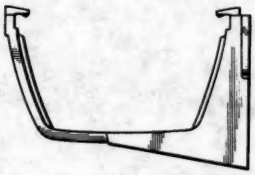
Robert W. Parker, Bearsted, and David E. Wells, Kent, both of England, assignors to Reed International PLC, London, England

Filed Nov. 30, 1983, Ser. No. 556,426

Claims priority, application United Kingdom, Jun. 9, 1983, 1013478

Term of patent 14 years

U.S. Cl. D8—380



285,649

WOODWORK CONNECTING JOINT

Frank R. Kobee, Mooresville, N.C., assignor to Trend Carolina Textiles, Inc., Mooresville, N.C.

Filed Jan. 6, 1984, Ser. No. 568,734

Term of patent 14 years

U.S. Cl. D8—382

285,650

BLIND RIVET-TYPE FASTENER

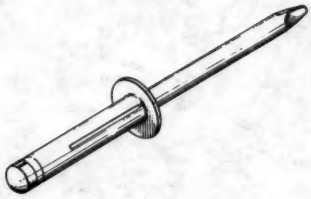
Raymond D. Lacey, Essendon, England, assignor to Avdel Limited, Herts, England

Filed May 13, 1983, Ser. No. 494,439

Claims priority, application United Kingdom, Nov. 19, 1982, 821009791

Term of patent 14 years

U.S. Cl. D8—386



285,651

BOLT

Yukichi Iwata, Tokyo, and Yasuo Suzuki, Asaka, both of Japan, assignors to Iwata Bolt Kogyo Kabushiki Kaisha, Tokyo; Kabushiki Kaisha Suzuki Rashi Seisakusho, Asaka and Sony Kabushiki Kaisha, Tokyo, all of, Japan

Filed Nov. 22, 1983, Ser. No. 554,355

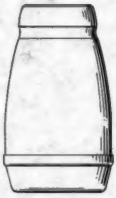
Claims priority, application Japan, May 23, 1983, 58-21400

Term of patent 14 years

U.S. Cl. D8—387

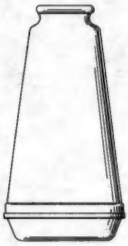
285,652
COMBINED BOTTLE AND DISPENSING PUMP FOR HAND LOTION OR THE LIKE
Perry W. Brown, Mankato, Minn., assignor to Sween Corporation, Lake Crystal, Minn.
Filed Mar. 30, 1984, Ser. No. 595,548
Term of patent 14 years
U.S. Cl. D9—300

285,653
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Vercon, Inc., Dallas, Tex.
Filed Apr. 9, 1984, Ser. No. 597,956
Term of patent 14 years
U.S. Cl. D9—349



285,654
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Oct. 26, 1984, Ser. No. 665,334
Term of patent 14 years
U.S. Cl. D9—349

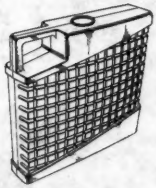
285,655
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Vercon, Inc., Dallas, Tex.
Filed Sep. 20, 1984, Ser. No. 652,383
Term of patent 14 years
U.S. Cl. D9—349



285,656
COMBINED PACKAGING CONTAINER AND LID
Douglas A. Champion, Toronto, Canada, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 18, 1983, Ser. No. 485,773
Term of patent 14 years
U.S. Cl. D9—352

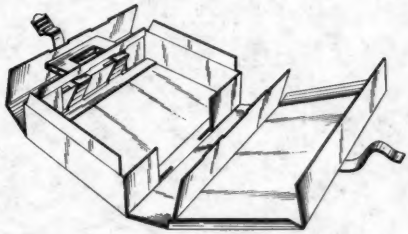
285,657
PACKAGING CONTAINER FOR WET TISSUES OR THE LIKE
Albert C. G. Poore, New Malden, England, assignor to Sterling Drug Inc., New York, N.Y.
Filed Mar. 2, 1984, Ser. No. 585,592
Claims priority, application United Kingdom, Sep. 20, 1983, 1015223
Term of patent 14 years
U.S. Cl. D9—353

285,658
CONTAINER FOR REFRIGERANT GEL OR THE LIKE
Stanley A. Katz, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Apr. 10, 1984, Ser. No. 603,888
Term of patent 14 years
U.S. Cl. D9—378

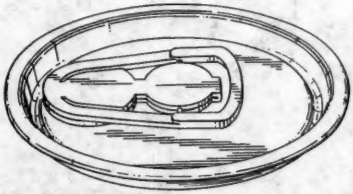


285,659
BOTTLE
John M. Paulovich, Hewitt, and Manharbhai K. Patel, Saddlebrook, both of N.J., assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Apr. 19, 1984, Ser. No. 601,827
Term of patent 14 years
U.S. Cl. D9—413

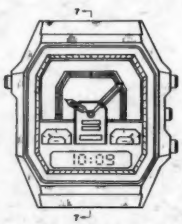
285,660
CARRYING CASE
Jan-Olof H. Cronsioe, Viktorigagatan 15, 411 25 Göteborg, Sweden
Filed Nov. 3, 1983, Ser. No. 548,347
Claims priority, application Sweden, May 18, 1983, 83-1404
Term of patent 14 years
U.S. Cl. D9—420



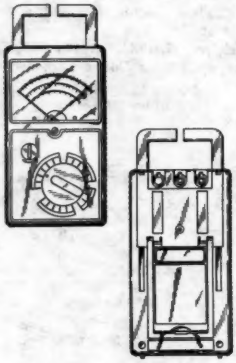
285,661
CONTAINER CLOSURE
Thomas D. Brownbill, Sidmouth, England, assignor to Metal Box p.l.c., England
Filed Oct. 19, 1983, Ser. No. 543,475
Claims priority, application United Kingdom, Apr. 26, 1983, 831012712
Term of patent 14 years
U.S. Cl. D9—435



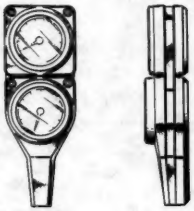
285,662
WRIST WATCH
Hayao Kano, Niiza, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Nov. 23, 1983, Ser. No. 554,825
Term of patent 14 years
U.S. Cl. D10—39



285,663
ELECTRICAL MEASURING INSTRUMENT
Peter G. Nichols, Dover; David C. Tedd, Folkestone; Terence M. Friend, Nr. Dover, and Christopher L. Steggall, London, all of England, assignors to Thorn EMI Instruments Limited, Dover, England
Filed Mar. 16, 1983, Ser. No. 475,936
Claims priority, application United Kingdom, Oct. 15, 1982, 821009279
Term of patent 14 years
U.S. Cl. D10—79

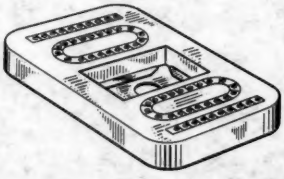


285,664
SCUBA INSTRUMENT CASE
Robert L. Applegate, Jr., Costa Mesa, Calif., assignor to Under Sea Industries, Inc., Rancho Dominguez, Calif.
Filed Nov. 7, 1983, Ser. No. 548,961
Term of patent 14 years
U.S. Cl. D10—102

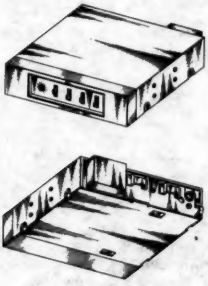


285,665
SWIMMING POOL INTRUSION ALARM
Paul F. Green, 452 Colonial Dr., Beavercreek, Ohio 45385
Filed Feb. 14, 1984, Ser. No. 579,985
Term of patent 14 years
U.S. Cl. D10—106

285,666
EUCHRE SCORING BOARD
Hans G. Post, Weston, Canada, assignor to The Diecut Group, Weston, Canada
Filed Jan. 30, 1984, Ser. No. 575,162
Term of patent 14 years
U.S. Cl. D10—46.1



285,667
MOBILE SECURITY UNIT
Fumio Tanaka, Suginami, and Akio Yamaguchi, Iwaki, both of Japan, assignors to Alpine Electronics, Inc., Tokyo, Japan
Filed Aug. 17, 1984, Ser. No. 641,976
Term of patent 14 years
U.S. Cl. D10—106



285,668
MOBILE SECURITY UNIT
Fumio Tanaka, Suginami, and Akio Yamaguchi, Iwaki, both of Japan, assignors to Alpine Electronics, Inc., Tokyo, Japan
Filed Aug. 17, 1984, Ser. No. 641,977
Term of patent 14 years
U.S. Cl. D10—106

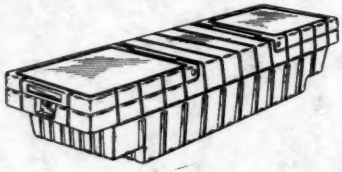
285,669
WIND CHIME
Virgil C. Brockmann, New Haven, Ind., assignor to Anita L. Nicholas and Edward R. Nicholas, both of Ossian, Ind.
Filed Jul. 29, 1983, Ser. No. 518,742
Term of patent 14 years
U.S. Cl. D10—116

285,670
BADGE
Yoshio Osawa, 8-15, Matsu 1-chome, Nishinari-ku, Osaka, Japan
Filed Jul. 2, 1984, Ser. No. 626,919
Term of patent 14 years
U.S. Cl. D11—116

285,671
ELECTRICALLY POWERED THREE WHEELED VEHICLE FOR THE HANDICAPPED
Allan R. Thieme; Henry L. Dominguez, both of Albuquerque, N. Mex.; Indulis Piziks, Saginaw, and Ronald D. Elson, Merrill, both of Mich., assignors to Amigo Sales, Inc., Bridgeport, Mich.
Filed Dec. 15, 1983, Ser. No. 561,827
Term of patent 14 years
U.S. Cl. D12—131

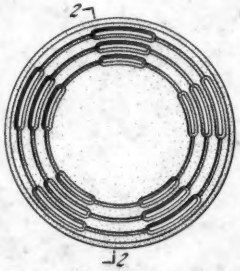
285,672
VEHICLE TIRE
Toshio Igarashi, Tokyo, and Hideaki Nishio, Saitama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Apr. 26, 1982, Ser. No. 372,261
Claims priority, application Japan, Oct. 27, 1981, 56-47514
Term of patent 14 years
U.S. Cl. D12—151

285,673
TRUCK TOOL BOX
John E. Waters, Waco, Tex., assignor to Advanced Plastics, Inc., Jonesboro, Ark.
Filed Jul. 25, 1983, Ser. No. 516,776
Term of patent 14 years
U.S. Cl. D12—157

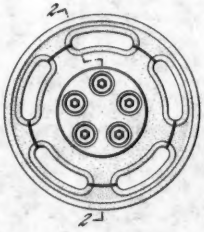


285,674
REAR VIEW MIRROR
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Beinasco, Italy
Filed Dec. 12, 1984, Ser. No. 680,882
Claims priority, application Italy, Jun. 15, 1984, 53512/84[U]
Term of patent 14 years
U.S. Cl. D12—187

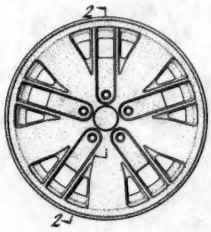
285,675
WHEEL COVER
Maurice P. Chandler, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 29, 1984, Ser. No. 645,236
Term of patent 14 years
U.S. Cl. D12—209



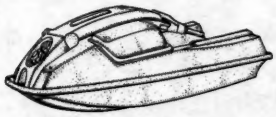
285,676
WHEEL COVER
David I. Clark, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 13, 1984, Ser. No. 681,311
Term of patent 14 years
U.S. Cl. D12—209



285,677
VEHICLE WHEEL
Robert L. Menking, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 3, 1984, Ser. No. 637,485
Term of patent 14 years
U.S. Cl. D12—211

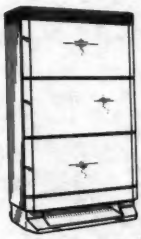


285,678
MOTORBOAT
Toshiro Suzuki, Kobe, and Seiichi Ino, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan
Filed Jul. 25, 1984, Ser. No. 634,293
Claims priority, application Japan, Feb. 7, 1984, 59-3978
Term of patent 14 years
U.S. Cl. D12—307

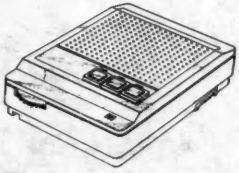


285,679
WATER VEHICLE
Robert S. Kachler, 15182 Bolsa Chica, Suite D, Huntington Beach, Calif. 92649
Filed Feb. 27, 1984, Ser. No. 583,962
Term of patent 14 years
U.S. Cl. D12—309

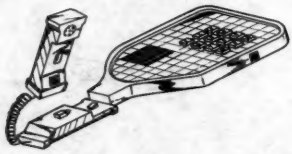
285,680
SWITCHING EXCHANGE FOR TELEPHONE AND/OR DATA COMMUNICATION
Howard R. Cederberg, Hayward, Calif., assignor to Northern Telecom Limited, Montreal, Canada
Filed Feb. 14, 1984, Ser. No. 580,087
Term of patent 14 years
U.S. Cl. D13—32



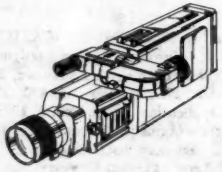
285,681
ELECTRONIC INTERCOMMUNICATION UNIT
Suemitsu Nakashima, Kawasaki, Japan, assignor to Nippon Tsushin Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Apr. 29, 1983, Ser. No. 490,139
Claims priority, application Japan, Feb. 9, 1983, 58-4675
The portion of the term of this patent subsequent to Jul. 2, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—92

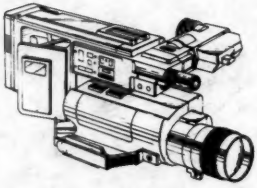


285,682
TELEPHONE
Peter Lee, 2nd. fl., 7, La. 93, Paoping Rd., Yungho City, Taipei Hsien, Taiwan
Filed Oct. 17, 1984, Ser. No. 661,716
Term of patent 14 years
U.S. Cl. D14—53

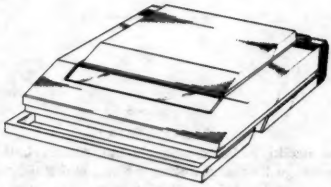


285,683
COMBINED VIDEO TAPE RECORDER AND VIDEO CAMERA
Masamitsu Shibata, Matsudo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Feb. 21, 1984, Ser. No. 582,231
Claims priority, application Japan, Aug. 25, 1983, 58-37024
Term of patent 14 years
U.S. Cl. D14—78





285,684
PROJECTION TELEVISION RECEIVER
Tsugio Akita, Osaka; Yoshiaki Kawata, Hyogo, and Toyoyuki Uematsu, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 6, 1983, Ser. No. 558,724
Claims priority, application Japan, Jun. 14, 1983, 58-25612
Term of patent 14 years
U.S. Cl. D14—80



285,685
SATELLITE DISH ANTENNA SUPPORT SPLIT RIB
John R. Winegard, Evergreen, and Keith B. Cowan, Arvada, both of Colo., assignors to Winegard Company, Burlington, Iowa
Filed Jan. 11, 1984, Ser. No. 569,836
Term of patent 14 years
U.S. Cl. D14—90

285,686

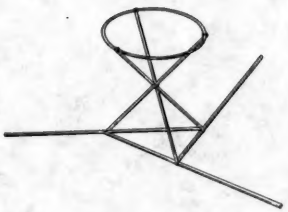
DISH ANTENNA SUPPORT

Christopher D. Langhart, Box 265, R.D. #2, New Hope, Pa. 18938

Filed Mar. 19, 1984, Ser. No. 590,777

Term of patent 14 years

U.S. Cl. D14—91



285,687

COMPUTER HOUSING

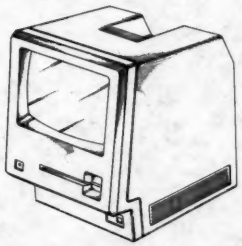
Jerrold C. Manock, 2350 Harvard St., Palo Alto, Calif. 94306; Terrell A. Oyama, Los Altos, and Steven P. Jobs, Los Gatos, both of Calif., assignors to Jerrold C. Manock, Calif.

Filed Oct. 13, 1983, Ser. No. 541,714

The portion of the term of this patent subsequent to Sep. 16, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—106



285,688

COMPUTER HOUSING

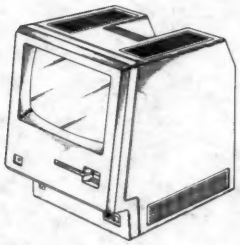
Jerrold C. Manock, 2350 Harvard St., Palo Alto, Calif. 94306; Terrell A. Oyama, Los Altos, and Steven P. Jobs, Los Gatos, both of Calif., assignors to Jerrold C. Manock

Continuation-in-part of Ser. No. 541,714, Oct. 13, 1983. This application Mar. 19, 1984, Ser. No. 590,225

The portion of the term of this patent subsequent to Sep. 16, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—106



285,689

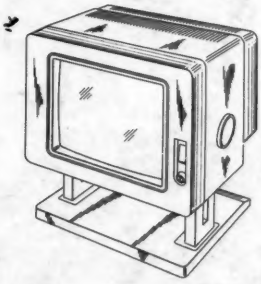
DISPLAY STATION FOR A DATA PROCESSING SYSTEM

Ted F. Kelley, Jr.; Collan B. Kneale, both of Rochester, Minn., and Peter J. Mendel, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1984, Ser. No. 590,654

Term of patent 14 years

U.S. Cl. D14—113

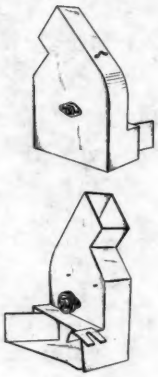


285,690

COMBINED GRASS COLLECTOR AND BLOWER

Thomas L. Hoepfner, 98 Prairiewood Dr., and Keith A. Leistikow, 88 Prairiewood Dr., both of Fargo, N. Dak. 58103

Filed Dec. 14, 1984, Ser. No. 681,835
Term of patent 14 years
U.S. Cl. D15—17



285,691

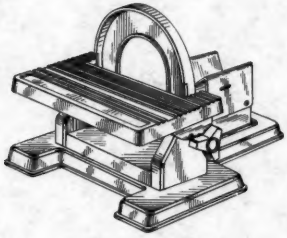
AGRICULTURAL IMPLEMENT

William M. Johnson, Winchlesea, Australia, assignor to Ralph McKay Limited, Maidstone, Australia

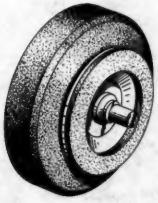
Filed Dec. 27, 1984, Ser. No. 686,698
Claims priority, application Australia, Jun. 29, 1984, 8007/84
Term of patent 14 years
U.S. Cl. D15—29

285,692
PORTABLE BATTERY POWERED REFRIGERATOR/FREEZER
Robert C. Albiez, 50 Grigor Street, Caloundra, Queensland, 4551, Australia
Filed Jul. 13, 1984, Ser. No. 630,532
Claims priority, application Australia, Jan. 20, 1984, 6346/84
Term of patent 14 years
U.S. Cl. D15—81

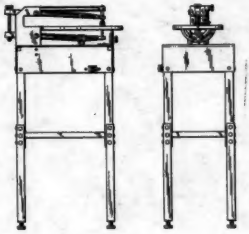
285,693
SUPPORT FOR DRILL POWERED ABRASIVE APPARATUS
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Mar. 9, 1984, Ser. No. 587,825
Term of patent 14 years
U.S. Cl. D15—125



285,694
GRINDING WHEEL FOR A GRINDING MACHINE
Gunnar Olovsson, P.O. Box 3031, S-981 03 Kiruna, Sweden
Filed Oct. 28, 1983, Ser. No. 546,416
Claims priority, application Sweden, Apr. 29, 1983, 831221
Term of patent 14 years
U.S. Cl. D15—126

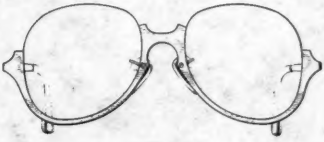


285,695
SCROLL SAW
John E. Miller, Jr., Kansas City, Mo., assignor to Woodmaster Tools, Inc., Kansas City, Mo.
Filed May 7, 1984, Ser. No. 607,592
Term of patent 14 years
U.S. Cl. D15—133



285,696
SUNGLASSES
Jean-Pierre Lamy, Geneva, Switzerland, assignor to Lamy Optic Industries, Inc., Miami, Fla.
Filed Apr. 23, 1984, Ser. No. 603,102
Term of patent 14 years
U.S. Cl. D16—102

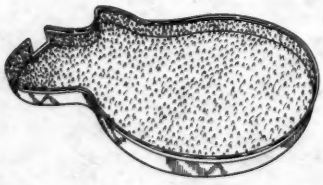
285,697
EYEGLASSES
Simon B. Fraser, Zell am See; Ferdinand A. Porsche, and Dirk Schmauser, both of Gries i. Pzg., all of Austria, assignors to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Mar. 12, 1984, Ser. No. 588,748
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 11AR4215/83
Term of patent 14 years
U.S. Cl. D16—116



285,698
TERRESTRIAL TELESCOPE
Takeo Ogasawara, Tokyo, Japan, assignor to Kowa Company Ltd., Japan
Filed Apr. 4, 1984, Ser. No. 596,633
Term of patent 14 years
U.S. Cl. D16—132

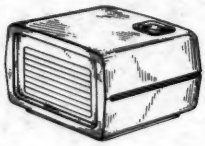
285,699
MAGNIFYING EKG READER OR THE LIKE
Norbert Leopoldi, Chicago, Ill., assignor to The Cloverline, Inc., Chicago, Ill.
Filed Oct. 31, 1983, Ser. No. 547,126
Term of patent 14 years
U.S. Cl. D16—135

285,700
GUITAR BACK PROTECTIVE COVER
Michael E. White, 51443 CR 5, Elkhart, Ind. 46514
Filed Apr. 18, 1984, Ser. No. 601,436
Term of patent 14 years
U.S. Cl. D17—20

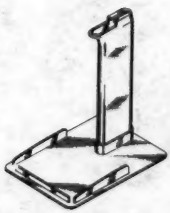


285,701
ARABIC FONT
Henry Bchakjian, 11-07 Long Rd., Fair Lawn, N.J. 07410
Filed Mar. 5, 1984, Ser. No. 586,080
Term of patent 14 years
U.S. Cl. D18—25

285,702
TABLE CALENDAR
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,524
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, MR 149
Term of patent 14 years
U.S. Cl. D19—20



285,703
CLIP HOLDER
David E. Decker, 9785 Samoa Ave., Tujunga, Calif. 91042
Filed Feb. 13, 1984, Ser. No. 579,372
Term of patent 14 years
U.S. Cl. D19—75



285,704

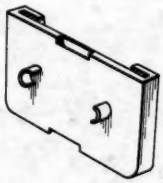
LABEL HOLDER FOR PEGBOARD DISPLAY UNIT

Alfred A. Burrell, 10223-133th Street, Edmonton, Alberta, Canada

Filed May 23, 1983, Ser. No. 497,268

Term of patent 14 years

U.S. Cl. D20—43



285,705

TOY CONSTRUCTION PIECE

Erling T. Dideriksen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Nov. 30, 1984, Ser. No. 676,532

Term of patent 14 years

U.S. Cl. D21—108

285,706

TOY CONSTRUCTION PIECE

Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Nov. 30, 1984, Ser. No. 676,715

Term of patent 14 years

U.S. Cl. D21—108

285,707

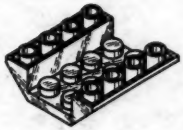
TOY CONSTRUCTION PIECE

Erling T. Dideriksen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Nov. 30, 1984, Ser. No. 676,553

Term of patent 14 years

U.S. Cl. D21—108



285,708

TOY FIGURE OR THE LIKE

Carolyn A. Schroeder, 827 S. Home Ave., Park Ridge, Ill. 60068

Filed Aug. 3, 1984, Ser. No. 637,290

Term of patent 14 years

U.S. Cl. D21—155

285,709

TOY ELEPHANT

Yam C. Wong, Kowloon, Hong Kong, assignor to Toymaster Industrial Limited, Kowloon, Hong Kong

Filed May 1, 1984, Ser. No. 605,814

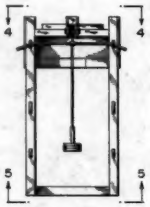
Claims priority, application United Kingdom, Nov. 10, 1983, 1016216

Term of patent 14 years

U.S. Cl. D21—162

285,710
TOY ELEPHANT
Yam C. Wong, Kowloon, Hong Kong, assignor to Toymaster Industrial Limited, Kowloon, Hong Kong
Filed May 1, 1984, Ser. No. 605,821
Claims priority, application United Kingdom, Nov. 10, 1983, 1 016 217
Term of patent 14 years
U.S. Cl. D21—162

285,711
WEIGHT LIFTING FRAME
William Paul, 4204 Clearview Rd., Allentown, Pa. 18103
Filed Apr. 2, 1984, Ser. No. 596,016
Term of patent 14 years
U.S. Cl. D21—195



285,712
HAND GUN SCOPE MOUNT
Billy H. Stoneman, Rte. 19, Box 442, Hot Springs, Ak. 71913
Filed Mar. 19, 1984, Ser. No. 591,103
Term of patent 14 years
U.S. Cl. D22—109

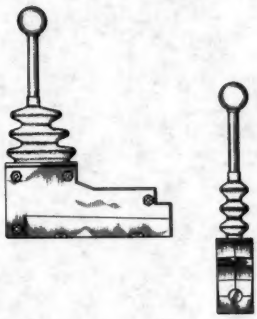
285,713
SPRAYER
Richard P. Garneau, Davie, Fla., assignor to The AFA Corporation, Forest City, N.C.
Filed Nov. 10, 1983, Ser. No. 550,314
Term of patent 14 years
U.S. Cl. D23—17

285,714
SPRAYER
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan
Filed Dec. 2, 1983, Ser. No. 557,627
Claims priority, application Japan, Jun. 3, 1983, 58-23547
Term of patent 14 years
U.S. Cl. D23—18

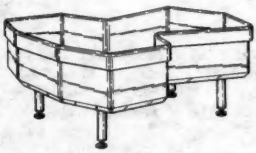
285,715
WALKING STILT
Mark Brantingham, 600 N. Meridian Rd., Youngstown, Ohio 44509, assignor to Mark Brantingham, Youngstown, Ohio
Filed Jan. 11, 1985, Ser. No. 690,775
Term of patent 14 years
U.S. Cl. D21—72

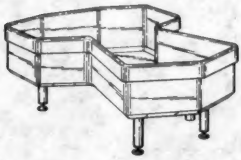
285,716
WATERBED AIR PURGING VALVE
Anthony J. Bova, 1133 N. Broadway, Stockton, Calif. 95205
Filed Jul. 25, 1983, Ser. No. 516,619
Term of patent 14 years
U.S. Cl. D23—19

285,717
VALVE ACTUATOR CONTROL UNIT
Peter D. Adams, La Canada, and John M. Hartshorne, Chino, both of Calif., assignors to Quadrastat Corporation, City of Industry, Calif.
Filed Jun. 13, 1983, Ser. No. 504,025
Term of patent 14 years
U.S. Cl. D23—19

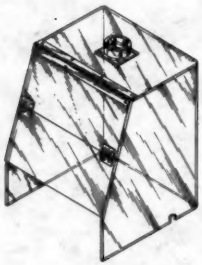


285,718
BATHTUB
Hans A. V. Johansson, Eslöv, Sweden, assignor to Arjo Instrument AB, Eslöv, Sweden
Filed Feb. 14, 1984, Ser. No. 580,008
Term of patent 14 years
U.S. Cl. D23—56





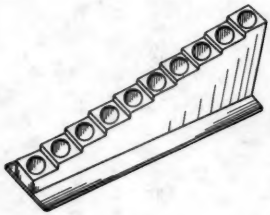
285,719
LABORATORY HOOD
Daniel R. Conlon, 600 Meetinghouse Rd., Jenkintown, Pa. 19046
Filed Dec. 24, 1984, Ser. No. 685,734
Term of patent 14 years
U.S. Cl. D23—151



285,720
CEILING FAN
Michael A. Markwardt, Fort Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.
Filed Sep. 12, 1985, Ser. No. 775,148
Term of patent 14 years
U.S. Cl. D23—158

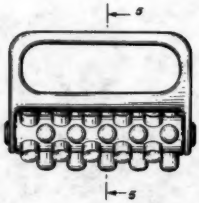
285,721
ARTERIAL PRESSURE BANDAGE
Jo Anne Simpher, 3914 Fillmore, St. Louis, Mo. 63116
Filed Oct. 28, 1983, Ser. No. 546,276
Term of patent 14 years
U.S. Cl. D24—27

285,722
DOSAGE DEVICE FOR SYRINGES
James B. Olson, Torsdagsvägen 40, S-863 00 Sundsbruk, Sweden
Filed Jun. 30, 1983, Ser. No. 509,299
Claims priority, application Sweden, Jan. 10, 1983, 83-0054
Term of patent 14 years
U.S. Cl. D24—31



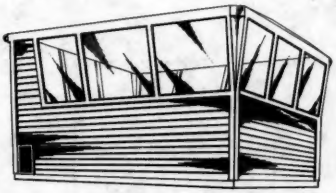
285,723
MASSAGER OR THE LIKE
Joe A. Taylor, P.O. Box 178, S J & E Rd., Auberry, Calif. 93602
Filed Dec. 12, 1983, Ser. No. 560,200
Term of patent 14 years
U.S. Cl. D24—36

285,724
HAND-HELD MASSAGER
Helmut Grundler, Valley Stream, N.Y., and Gottfried Grundler, Salzburg, Austria, assignors to Actifit, Inc., Valley Stream, N.Y.
Filed Jan. 10, 1984, Ser. No. 569,680
Term of patent 14 years
U.S. Cl. D24—36

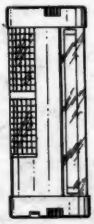


285,725
CULTURE FLASK OR THE LIKE
Larry A. Franchere, Oxnard, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Sep. 28, 1983, Ser. No. 536,933
Term of patent 14 years
U.S. Cl. D24—56

285,726
ASPHALT PLANT CONTROL HOUSE
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed Jan. 27, 1984, Ser. No. 574,608
Term of patent 14 years
U.S. Cl. D25—22

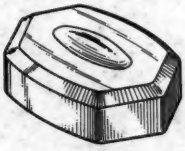


285,727
COMBINED FLUORESCENT LAMP, FLASHLIGHT AND TWIN BLINKING LAMPS
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Dec. 20, 1983, Ser. No. 563,519
Claims priority, application United Kingdom, Jun. 21, 1983, 1 013 677
Term of patent 14 years
U.S. Cl. D26—42



285,728
LAMP BASE
Stanley M. Kujawski, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,867
Term of patent 14 years
U.S. Cl. D26—94

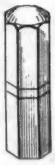
285,729
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Dec. 28, 1984, Ser. No. 687,394
Term of patent 14 years
U.S. Cl. D28—2



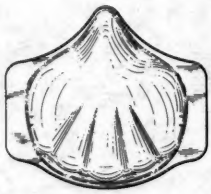
285,730
COSMETICS APPLICATOR
Helen C. Bulwik, Hayward, Calif., assignor of Sanca International Inc., San Francisco, Calif.
Filed Jul. 27, 1984, Ser. No. 635,289
Claims priority, application United Kingdom, Aug. 2, 1984, 1017665
Term of patent 14 years
U.S. Cl. D28—7

285,731
DRY SHAVER
Teizoh Satoh, and Masaru Miyazaki, both of Tokyo, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 27, 1984, Ser. No. 644,589
Claims priority, application United Kingdom, Mar. 2, 1984, 1.018.268; Mar. 2, 1984, 1.018.269
Term of patent 14 years
U.S. Cl. D28—50

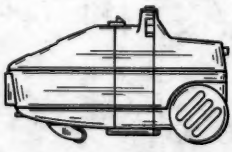
285,732
COSMETIC CONTAINER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Mar. 11, 1983, Ser. No. 474,298
Term of patent 14 years
U.S. Cl. D28—85



285,733
DISPOSABLE FACE MASK
James M. Cooper, Shawnee Mission, Kans., assignor to Parmellee Industries, Inc., Kansas City, Mo.
Filed Dec. 9, 1983, Ser. No. 559,754
Term of patent 14 years
U.S. Cl. D29—8



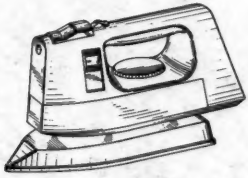
285,734
VACUUM CLEANER
Kenichi Haruguchi; Sachio Yamamoto, and Akira Tsukata, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 1, 1984, Ser. No. 585,348
Claims priority, application Japan, Sep. 6, 1983, 58-39190
Term of patent 14 years
U.S. Cl. D32—21



285,735
CARPET SWEEPER
Michio Hanyu, Nihonbashi, Japan, assignor to Hukuba Kogyo Kabushiki Kaisha, Japan
Filed Oct. 21, 1983, Ser. No. 544,389
Claims priority, application Japan, Apr. 28, 1983, 58-18000
Term of patent 14 years
U.S. Cl. D32—38

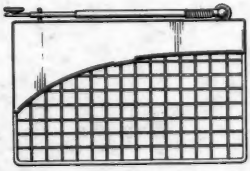
285,736
WATER REMOVER
Zane E. Seely, Walla Walla, Wash., assignor to Delta Corp., Inc., Walla Walla, Wash.
Filed Mar. 12, 1984, Ser. No. 588,908
Term of patent 14 years
U.S. Cl. D32—41

285,737
STEAM IRON
Franz A. Stutzer, and Michael Knochner, both of Offenbach am Main, Fed. Rep. of Germany, assignors to Rowenta-Werke, GmbH, Fed. Rep. of Germany
Filed Aug. 2, 1984, Ser. No. 636,972
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 5 MR 10507
Term of patent 14 years
U.S. Cl. D32—70



285,738
STEAM IRON
Shinri Ogawa, and Yutaka Tanii, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed May 1, 1984, Ser. No. 605,761
Claims priority, application Japan, Nov. 1, 1983, 58-47743
Term of patent 14 years
U.S. Cl. D32—70

285,739
COMBINED STEAM IRON SUPPORT, WATER TANK AND CORD SUPPORT
Alfredo Cavalli, Via Galileo Galilei, 9, Pessano Con Bornago, (Milan), Italy
Filed Apr. 19, 1984, Ser. No. 602,200
Claims priority, application Italy, Oct. 20, 1983, 23303/83[U]
Term of patent 14 years
U.S. Cl. D32—73



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.E.G. Elotherm GmbH: *See—*
Matthes, Hans G.; and Wittenbecher, Hasso, 4,612,611, Cl. 363-49.000.

A. E. Staley Manufacturing Company: *See—*
Pickens, Carl E.; and Niekamp, Carl W., 4,612,284, Cl. 435-96.000.

Abar Ipsen Industries: *See—*
Moller, Craig A.; and Wolter, Eric H., 4,612,651, Cl. 373-130.000.

Abe, Kazuyoshi; Kawasaki, Masahiko; Yazaki, Kazuhiko; and Sekine, Yoshitada, to Nissan Motor Company, Limited. Assembly line manufacturing control apparatus. 4,611,380, Cl. 29-430.000.

Abe, Ryusuke; Shimizu, Makoto; and Hirose, Yasuo, to Hitachi, Ltd. Nuclear fuel element and process for fabricating the same. 4,612,159, Cl. 376-351.000.

Abe, Toshiyuki: *See—*
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.

Abebe, Moges; Burns, William K.; and Villarruel, Carl A., to United States of America, Navy. Polarization-preserving single mode fiber coupler. 4,612,028, Cl. 65-4.200.

Abel, Edward: *See—*
Third, Sinclair M.; and Abel, Edward, 4,612,527, Cl. 336-5.000.

Abel, Heinz: *See—*
Schafer, Paul; Abel, Heinz; Guth, Christian; and Stehlin, Albert, 4,612,352, Cl. 525-404.000.

Abend, Phillip G.: *See—*
Novakovic, Mario; and Abend, Phillip G., 4,612,136, Cl. 252-134.000.

Abex Corporation: *See—*
Larson, Hugo R.; and Subramanyam, Dilip K., 4,612,067, Cl. 148-329.000.

Abiko, Kenji: *See—*
Morita, Hideo; Abiko, Kenji; and Nakamura, Tetsuo, 4,611,403, Cl. 33-169.00R.

Abt, Edgar J., to Motorola, Inc. Shock mount. 4,611,871, Cl. 339-93.00C.

Ache, Lani G.: *See—*
Rung, Robert; and Ache, Lani G., 4,611,839, Cl. 285-367.000.

Ackert, Robert J.; Witty, Robert W.; and Crozier, Peter A., to Algoma Steel Corporation Limited, The. Apparatus for the production of improved railway rails by accelerated cooling in line with the production rolling mill. 4,611,789, Cl. 266-81.000.

ACMA: *See—*
Aiuola, Franco; and Piccinini, Renato, 4,612,080, Cl. 156-504.000.

Acme Fence and Iron Company, Inc.: *See—*
Thedford, Russell E., deceased, 4,612,063, Cl. 148-12.00B.

Acromed Corporation: *See—*
Steffee, Arthur D., 4,611,581, Cl. 128-69.000.

Adachi, Motoyuki; and Kohashi, Toru, to Yamato Scale Company, Limited. Analog weighing system with digital processing via a single A/D converter. 4,611,674, Cl. 177-1.000.

Adachi, Yoshitugu: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.

Addair, George W. Mattress exercise apparatus. 4,611,804, Cl. 272-126.000.

Adolphi, Heinrich: *See—*
Burstinghaus, Rainer; Henkes, Erhard; Kiehs, Karl; and Adolphi, Heinrich, 4,612,306, Cl. 514-112.000.

Advanced Micro Devices, Inc.: *See—*
Vasseghi, Nader; and Goddard, Donald G., 4,612,458, Cl. 307-446.000.

AEG Elotherm GmbH: *See—*
Wolter, Bernd; and Pott, Paul G., 4,612,101, Cl. 204-224.00M.

Aelion, Rene: *See—*
Noyes, Howard B.; and Aelion, Rene, 4,611,851, Cl. 297-199.000.

Aeroquip Corporation: *See—*
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,611,618, Cl. 137-68.100.

Aesculap-Werke AG vormals Jetter & Scheerer: *See—*
Steidle, Gerhard, 4,611,585, Cl. 128-91.00A.

Affarsverket FFV: *See—*
Pettersson, Rolf T.; Edlund, Hans G. U.; and Regebro, Bengt I. C., 4,611,540, Cl. 102-372.000.

Agbay, Anthony J.: *See—*
Carlson, John H.; and Agbay, Anthony J., 4,611,478, Cl. 70-164.000.

Agee, John M.; and King, Francis C., to Agee, John M. Articulated Colles' fracture splint. 4,611,586, Cl. 128-92.00A.

AGFA-GEVAERT N.V.: *See—*
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,611,905, Cl. 355-14.00D.

Ahn, Hongsik, to Intertherm Inc. Drain for condensate from flue gas. 4,611,622, Cl. 137-145.000.

Aiko, Takuya: *See—*
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Ainsworth Nominees Pty. Limited: *See—*
Palmer, Robert L., 4,611,808, Cl. 273-138.00A.

Air Products and Chemicals, Inc.: *See—*
Feitler, David, 4,612,387, Cl. 560-232.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kayakabe, Nobuhiro; and Sasaki, Isamu, 4,611,702, Cl. 192-110.00R.
Yasuda, Tomino; and Hashimoto, Akio, 4,611,682, Cl. 180-79.100.

Aiuola, Franco; and Nannini, Luciano, to Emhart Corporation. Control device for welding rods in packaging machines. 4,611,455, Cl. 53-373.000.

Aiuola, Franco; and Piccinini, Renato, to ACMA. Web splicing apparatus. 4,612,080, Cl. 156-504.000.

Aizawa, Takemi: *See—*
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.

Aizawa, Yasuo: *See—*
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,611,549, Cl. 114-144.00E.

Ajiro, Yutaka: *See—*
Kakizaki, Katsumi; and Ajiro, Yutaka, 4,612,472, Cl. 310-339.000.

Akatsuka, Takao: *See—*
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,611,562, Cl. 123-440.000.

Akopiants, Vladimir A.: *See—*
Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., 4,611,625, Cl. 137-505.250.

Akzona Incorporated: *See—*
Haubold, Herbert; and Burg, Bernhard, 4,612,147, Cl. 264-46.100.

Albany-Chicago Corporation: *See—*
Zelkowitz, Phillip, 4,611,649, Cl. 164-108.000.

Albertson, Edward. Sidewalk and curb crevice weeder. 4,611,666, Cl. 172-13.000.

Alcan International Limited: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.

Alcidi, Mario. Method and device to overcome the pile-up effect in scintillation counters. 4,612,443, Cl. 250-362.000.

Alderson, William S.: *See—*
Ishman, Neal H.; and Alderson, William S., 4,612,575, Cl. 358-160.000.

Aleck, Benjamin J., to Grumann Aerospace Corporation. Tubular element coupling means. 4,611,837, Cl. 285-305.000.

Alexander, M. Grayson; and Riley, Brian, to Combustion Engineering, Inc. Power cell having a glass solid electrolyte. 4,612,263, Cl. 429-104.000.

Alexopoulos, Kessar D.: *See—*
Varotsos, Panayiotis A.; Alexopoulos, Kessar D.; and Nomicos, Konstantine D., 4,612,506, Cl. 324-348.000.

Alfred Teves GmbH: *See—*
Belart, Juan, 4,611,858, Cl. 303-6.00R.

Algoma Steel Corporation Limited, The: *See—*
Ackert, Robert J.; Witty, Robert W.; and Crozier, Peter A., 4,611,789, Cl. 266-81.000.

Allied Corporation: *See—*
DellaVecchia, Michael P.; Mackey, Joseph E.; and Steinberg, Albert H., 4,612,238, Cl. 428-228.000.
Lai, Yu-Chin; DeBona, Bruce T.; and Prevorsek, Dusan C., 4,612,362, Cl. 528-190.000.
Messersmith, William K.; and Bach, Lloyd G., 4,611,696, Cl. 192-13.00A.
Muccigrosso, Deborah A.; Mares, Frank; Diamond, Steven E.; and Solar, Jeffrey P., 4,612,402, Cl. 568-408.000.
Nash, Donald R., 4,611,570, Cl. 123-601.000.
Pande, Krishna P., 4,611,388, Cl. 29-576.00E.
Petersen, Carl C.; Normann, Richard W.; and Niles, Paul D., 4,611,880, Cl. 339-206.00R.
Pfeiffer, Robert C., 4,611,854, Cl. 297-468.000.

Punako, Stephen; and Gallusser, David O., 4,611,873, Cl. 339-94.00M.
Allied Tube & Conduit Corporation: *See—*
Willetts, Charles A., 4,611,480, Cl. 72-326.000.
Alphadent: *See—*
Heinix, Lucien J. C., 4,611,991, Cl. 433-60.000.
Alps Electric Co., Ltd.: *See—*
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,612,539, Cl. 340-710.000.
Kikuchi, Kazuo, 4,612,463, Cl. 307-490.000.
Kowata, Masakatsu; and Hiyama, Torao, 4,612,566, Cl. 357-80.000.
Ushida, Susumu, 4,611,882, Cl. 357-80.000.
Als, Heidelise; and Zeybekoglu, Annie, to Children's Medical Center Corporation, The. Infant's garment. 4,611,353, Cl. 2-69.000.
Alsthom: *See—*
Nicoloso, Dante, 4,612,428, Cl. 200-148.00R.
Alsthom Atlantique: *See—*
Saint-M'Leuz, Rene-Pierre, 4,611,952, Cl. 405-224.000.
Alt, Christian; Kober, Arthur; and Kiesewetter, Willi, to Dr. M. Dr. Muller AG. Clarifying filtering centrifuge and method of use. 4,612,126, Cl. 210-787.000.
Altrogge, Wilhelm E. Door mounted operating mechanism for an overhead door. 4,611,430, Cl. 49-199.000.
Aluminium Pechiney: *See—*
Langon, Bernard, 4,612,105, Cl. 204-286.000.
Aluminum Company of America: *See—*
Hovland, Lyle W.; and Klingensmith, James D., 4,612,552, Cl. 343-880.000.
La Barge, Robert L.; and Ewing, Ronald J., 4,611,381, Cl. 29-432.000.
ALZA Corporation: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,612,186, Cl. 424-15.000.
Wong, Patrick S. L.; Barclay, Brian; Deters, Joseph C.; and Theeuwes, Felix, 4,612,008, Cl. 604-892.000.
Alzati, Angelo: *See—*
Stefani, Fabrizio; Cini, Carlo; and Alzati, Angelo, 4,612,452, Cl. 307-300.000.
AM International: *See—*
Westdale, Virgil W.; and Hanrahan, James L., 4,612,269, Cl. 430-49.000.
AM International, Inc.: *See—*
Westdale, Virgil W., 4,612,272, Cl. 430-98.000.
Westdale, Virgil W.; and Hanrahan, James L., 4,612,273, Cl. 430-98.000.
Amazawa, Kiyoshi: *See—*
Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,612,662, Cl. 381-10.000.
Ambrus, Clara; and Horvath, Csaba. Removing heavy metal ions from blood. 4,612,122, Cl. 210-638.000.
Amdahl Corporation: *See—*
Woffinden, Gary A.; Hanson, Donald L.; and Amdahl, Gene M., 4,612,612, Cl. 364-200.000.
Amdahl, Gene M.: *See—*
Woffinden, Gary A.; Hanson, Donald L.; and Amdahl, Gene M., 4,612,612, Cl. 364-200.000.
American Biltrite Inc.: *See—*
Smith, Merrill M.; and Ferguson, Donald C., 4,612,074, Cl. 156-85.000.
American Colloid Company: *See—*
Takeda, Hisao; and Taniguchi, Yasunori, 4,612,250, Cl. 428-500.000.
American Cyanamid Company: *See—*
Sapp, Bobby L., 4,611,951, Cl. 405-128.000.
American Dental Association Health Foundation: *See—*
Brown, Walter E.; and Chow, Laurence C., 4,612,053, Cl. 706-35.000.
American Monitor Corporation: *See—*
Dawes, Dennis K., 4,612,291, Cl. 436-174.000.
Amoco Corporation: *See—*
Arzoumanidis, Gregory G.; Khelghatian, Habet M.; and Lee, Sam S., 4,612,299, Cl. 502-104.000.
Connolly, John F.; Thrash, Robert J.; and Kretchmer, Richard A., 4,612,265, Cl. 429-196.000.
Harrington, John P., 4,611,662, Cl. 166-339.000.
AMP Incorporated: *See—*
Feiber, Wolfgang E. A.; Keahey, Sammie G.; and Kunkle, James R., 4,611,846, Cl. 294-88.000.
Glover, Douglas W.; Hoffer, John C.; Johnson, Erlon F.; and Schaffer, Ronald R., 4,611,887, Cl. 350-96.210.
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,611,878, Cl. 339-186.00M.
MacKissinger, William, Jr.; and Phillips, Howard C., 4,611,484, Cl. 72-481.000.
Rose, William H.; and Shaffer, David T., 4,612,422, Cl. 200-5.00R.
Analog and Digital Systems, Inc.: *See—*
DeFreitas, Richard E., 4,612,654, Cl. 375-30.000.
Anastasie, Roger: *See—*
Soster, Marie C.; and Anastasie, Roger, 4,611,735, Cl. 225-96.500.
Anderson, Richard N., to Hunter Douglas Inc. Unitized secondary glazing frame and venetian blind assembly. 4,611,648, Cl. 160-107.000.
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., to Astra Lakemedel Aktiebolag. Tricyclic amines with central dopaminergic activity. 4,612,316, Cl. 514-290.000.
Ando, Kenji: *See—*
Nakamura, Takeshi; Ando, Kenji; and Matsumoto, Ikuo, 4,612,471, Cl. 310-321.000.
Ando, Kunio: *See—*
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, 4,612,451, Cl. 307-270.000.
Andrae, Ralph. Aeroplane propeller. 4,611,972, Cl. 416-214.00R.
Andresen, Bernhard H.; and Keeney, Stanley C., to Texas Instruments Incorporated. Test input demultiplexing circuit. 4,612,499, Cl. 324-73.00R.
Andrews, Philip S.; and Onder, Kemal, to Dow Chemical Company, The. Polyamide/polyetherimide alloys. 4,612,353, Cl. 525-432.000.
Andriewsky, Miguel S. Heavy duty weighing machine having high precision and resolution features. 4,611,678, Cl. 177-211.000.
Angevine, Philip J.; Mitchell, Kenneth M.; Oleck, Stephen M.; and Shih, Stuart S., to Mobil Oil Corporation. Hydrocracking process using zeolite beta. 4,612,108, Cl. 208-111.000.
Anschultz, Jackie R.: *See—*
Dixon, Carl R.; and Anschultz, Jackie R., 4,611,965, Cl. 414-299.000.
Anstey, Henry D.; and Viaud, Jean, to Deere & Company. Cylindrical bale-forming press with torque-limiting device. 4,611,535, Cl. 100-43.000.
Anton Paar, KG: *See—*
Krenn, Manfred; Raffer, Gerhard; Wagendristel, Alfred; and Bangert, Herwig, 4,611,487, Cl. 73-81.000.
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, to Hodogaya Chemical Co., Ltd. Fluoran compounds. 4,612,558, Cl. 346-221.000.
Aoki, Sadao: *See—*
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.
Applied Technologies Associates: *See—*
Van Steenwyk, Donald H., 4,611,405, Cl. 33-304.000.
Arakawa, Toshihiko: *See—*
Kasai, Kiyoshi; Tsukidate, Takaaki; Nagata, Shinji; and Arakawa, Toshihiko, 4,612,297, Cl. 501-97.000.
Arens Controls, Inc.: *See—*
Gregory, Ted W., 4,611,502, Cl. 74-502.000.
Arino, Masao; and Inoue, Yoshimichi, to Jidosha Kiki Co., Ltd. Reaction transmitting mechanism for brake booster. 4,611,526, Cl. 91-369.00A.
Arjomari-Prioux: *See—*
Fredenucci, Pierre; and Berhaut, Jean-Bernard, 4,612,251, Cl. 428-511.000.
Arlasky, David: *See—*
Crites, Allan B., 4,611,477, Cl. 70-416.000.
Armstrong World Industries, Inc.: *See—*
Pressley, James O., 4,611,445, Cl. 52-144.000.
Arnall, Henry O.: *See—*
Rowton, Danny E., 4,611,739, Cl. 227-66.000.
Arsenault, Ronald G. Caliper for thread measurement. 4,611,404, Cl. 33-199.00R.
Arvidsson, Folke L.: *See—*
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.
Arzoumanidis, Gregory G.; Khelghatian, Habet M.; and Lee, Sam S., to Amoco Corporation. Magnesium carboxylate supports. 4,612,299, Cl. 502-104.000.
Asahi Electronics Co., Ltd.: *See—*
Kurosawa, Tsutomu, 4,612,590, Cl. 360-91.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ueda, Fumihide, 4,612,259, Cl. 428-661.000.
Asaka Co., Ltd.: *See—*
Ichinose, Izumi, 4,612,569, Cl. 358-22.000.
Asami, Kazutomo: *See—*
Wada, Fumio; Ishijima, Koji; Sano, Fumiaki; and Asami, Kazutomo, 4,611,473, Cl. 62-503.000.
Asano, Kenichi: *See—*
Sato, Toshiya; Asano, Kenichi; and Yamaguchi, Yuzo, 4,612,190, Cl. 424-49.000.
Asano, Masamichi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Logic circuit having voltage booster. 4,612,462, Cl. 307-482.000.
Asars, Juris A.: *See—*
Chen, Cheng-lin; Asars, Juris A.; and Vaerewyck, Eugene G., 4,612,500, Cl. 324-96.000.
ASE (UK) Limited: *See—*
Patterson, Michael, 4,611,825, Cl. 280-808.000.
Asea AB: *See—*
Stenkvist, Sven-Einar, 4,612,650, Cl. 373-108.000.
Asendorf, Robert H.; Fitzpatrick, James P.; and Graves, Burton W., to Itek Corporation. Automatic frequency identifier for radar signals. 4,612,545, Cl. 343-18.00E.
Ashizaki, Shigeya; Natsuhara, Masao; Sugahara, Koichi; and Muranishi, Hideo, to Matsushita Electronics Corporation. In-line type electron gun. 4,612,474, Cl. 313-414.000.
Ashland Oil, Inc.: *See—*
Hamon, Ray C., 4,612,054, Cl. 106-264.000.

Hettinger, William P., Jr.; and Beck, Hubert W., 4,612,298, Cl. 502-65.000.

Asociation pour la Recherche et le Developpement des Methodes et Processus Industriels: *See*—
Benaben, Patrick; and Tardy, Rene , 4,612,091, Cl. 204-51.000.

Astra Lakemedel Aktiebolag: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

AT&T Bell Laboratories: *See*—
Cline, Terry W.; Karr, Michael A., III; and Levinson, Frank H., 4,611,886, Cl. 350-96.200.
Forrest, Stephen R.; Kaplan, Martin L.; and Schmidt, Paul H., 4,611,385, Cl. 29-574.000.
Gans, Michael J.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,612,518, Cl. 332-21.000.
Keith, Harvey D.; von Seggern, Heinz; Wang, Tsuey T.; and West, James E., 4,612,145, Cl. 264-22.000.
Moyer, Harold W., 4,612,564, Cl. 357-70.000.
Starke, Richard J., 4,612,659, Cl. 377-72.000.
Toumani, Rouben, 4,612,417, Cl. 179-77.000.

AT&T Information Systems: *See*—
Clarke, John E.; Hardesty, Edwin C.; and Reichard, George W., Jr., 4,611,875, Cl. 339-154.00A.

AT&T Information Systems Inc.: *See*—
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.
Juang, Biing-Hwang, 4,612,414, Cl. 179-1.50R.

AT&T Laboratories: *See*—
Dubois, Lawrence H.; and Nuzzo, Ralph G., 4,612,407, Cl. 585-434.000.

AT&T Technologies: *See*—
Clarke, John E.; Hardesty, Edwin C.; and Reichard, George W., Jr., 4,611,875, Cl. 339-154.00A.

AT&T Technologies, Inc.: *See*—
Flemming, John P. W., 4,611,845, Cl. 294-87.100.
Kiersarsky, Albert; Sauer, Earl S.; Vesperman, William; and Wilson, Max K., 4,612,233, Cl. 428-206.000.

Atlantic Richfield Company: *See*—
Shum, Wilfred P.; and White, John F., 4,612,390, Cl. 562-522.000.
Wieting, Robert D.; and Potter, Richard R., 4,612,411, Cl. 136-265.000.

Atlas Copco Aktiebolag: *See*—
Hansson, Gunnar C., 4,611,671, Cl. 173-162.00H.

Atochem: *See*—
Bertocchio, Rene; Genest, Bernard; and Mathais, Henri, 4,612,133, Cl. 252-68.000.
Lescaut, Pierre L., 4,611,833, Cl. 285-55.000.

Aubry, Jacques A.; and Bonfils, Michel R., to Societe Nationale Industrielle et Aerospatiale. Device comprising cyclic plates driven by flexible blades, for controlling a helicopter rotor. 4,611,971, Cl. 416-114.000.

Austin, Faye: *See*—
Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,612,282, Cl. 435-68.000.

Autoflug GmbH: *See*—
Hansen, Holger, 4,612,667, Cl. 455-98.000.

Avulunga Pty Ltd.: *See*—
Bellhouse, Christopher P., 4,611,579, Cl. 128-11.000.

Awa Paper Manufacturing Co., Ltd.: *See*—
Shinkai, Takashi, 4,611,361, Cl. 15-104.930.

Ayervais, Michael. Image enhancing television attachment. 4,612,583, Cl. 358-250.000.

Babcock & Wilcox Company, The: *See*—
Johnson, Thomas A.; and Hill, Charles A., 4,612,240, Cl. 428-289.000.
Kaya, Azmi; and Keyes, Marion A., IV, 4,612,621, Cl. 364-494.000.
Orcutt, Donald R., 4,612,046, Cl. 75-96.000.

Bach, Lloyd G.: *See*—
Messersmith, William K.; and Bach, Lloyd G., 4,611,696, Cl. 192-13.00A.

Bacon, Francis L.; and Houde, Donald J., to Telebyte Corportion. Data compression apparatus and method. 4,612,532, Cl. 340-347.0DD.

Baggiolini, Enrico G.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. 25,26-Dehydro-1α,23(S,R)-dihydroxycholecalciferol and its epimers. 4,612,308, Cl. 514-167.000.

Bahr, Bernd: *See*—
Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, 4,612,142, Cl. 252-555.000.

Baika, Toyokazu: *See*—
Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, 4,611,568, Cl. 123-559.000.

Bailey, Kevin D.: *See*—
Osborne, Robert; and Bailey, Kevin D., 4,612,377, Cl. 546-345.000.

Baker, Garland A.; and Powers, Ronald S., to Holland Wire Products, Inc. Coil spring assembly apparatus. 4,611,640, Cl. 140-92.300.

Baker Oil Tools, Inc.: *See*—
Salerni, John V.; and Wetzel, Rodney J., 4,611,658, Cl. 166-134.000.
Stout, Gregg W.; and Peterson, Elmer R., 4,611,660, Cl. 166-297.000.

Ball Corporation: *See*—
Falk, Robert A.; and Phillis, Gary L., 4,611,912, Cl. 356-5.000.

Ball, Diana M.: *See*—
Davis, Christopher K.; Stein, Paul J.; and Ball, Diana M., 4,612,637, Cl. 370-95.000.

Ballard, Louis F., to MTD Products Inc. Tine assembly. 4,611,669, Cl. 172-545.000.

Ban, Itsuki; and Nakajima, Akihiro. Semiconductor electric motor having a rotary transformer to excite a rotor. 4,612,486, Cl. 318-254.000.

Bangert, Herwig: *See*—
Krenn, Manfred; Raffer, Gerhard; Wagendristel, Alfred; and Bangert, Herwig, 4,611,487, Cl. 73-81.000.

Barclay, Brian: *See*—
Wong, Patrick S. L.; Barclay, Brian; Deters, Joseph C.; and Theeuwes, Felix, 4,612,008, Cl. 604-892.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Oberstrass, Detlev, 4,611,767, Cl. 242-18.0DD.

Barnes, Robert A., to RCA Corporation. Oscillator-frequency control interface circuit. 4,612,574, Cl. 358-158.000.

Barrabes, Claude, to La Telemecanique Electrique. General purpose loss-proof terminal for forming electric connections by clamping between two conducting elements. 4,611,876, Cl. 339-263.00R.

Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, to Lever Brothers Company. Skin treatment composition. 4,612,331, Cl. 514-558.000.

Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, to Warner-Lambert Company. 1,2,4-benzothiadiazine oxide derivatives. 4,612,311, Cl. 514-222.000.

Bartley, Michael L.: *See*—
Chung, Ding-Yu; Debroy, Tapan K.; and Bartley, Michael L., 4,612,338, Cl. 523-414.000.

Bartoszyk, Gerd: *See*—
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.

Bartsch, Wolfgang: *See*—
Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, 4,612,313, Cl. 514-255.000.

Basf Aktiengesellschaft: *See*—
Bott, Kaspar; Penzel, Erich; and Eckert, Guenter, 4,612,392, Cl. 564-207.000.
Burstinghaus, Rainer; Henkes, Erhard; Kiehs, Karl; and Adolphi, Heinrich, 4,612,306, Cl. 514-112.000.
Degner, Dieter; Steckhan, Eberhard; and Grosse-Brinkhaus, Karl H., 4,612,092, Cl. 204-59.00R.
Dyllick-Brenzinger, Rainer, 4,612,015, Cl. 8-527.000.
Franke, Albrecht; Gries, Josef; Mueller, Claus D.; and Lenke, Dieter, 4,612,320, Cl. 514-317.000.
Jahn, Dieter; Becker, Rainer; Keil, Michael; and Wuerzer, Bruno, 4,612,036, Cl. 71-91.000.

BASF Corporation, Inmont Divison: *See*—
Chung, Ding-Yu; Debroy, Tapan K.; and Bartley, Michael L., 4,612,338, Cl. 523-414.000.

Bassett, Alton H.: *See*—
Kennette, John W.; Buyofsky, Conrad C.; and Bassett, Alton H., 4,612,226, Cl. 428-134.000.

Battersby, Norma. Decorative and protective jewelry chain guard. 4,611,368, Cl. 24-116.00R.

Bauer, Bernhard: *See*—
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,611,932, Cl. 384-481.000.

Bauer, Manfred, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,611,563, Cl. 123-449.000.

Bauer, Roland: *See*—
Laptewicz, Joseph E., Jr.; and Bauer, Roland, 4,611,588, Cl. 128-132.00R.

Baumann, Burke B.: *See*—
Pantry, William J.; and Baumann, Burke B., 4,612,542, Cl. 340-825.500.

Baus, Heinz G. Coupling assembly for joining two profiled rails. 4,611,947, Cl. 403-104.000.

Baxendale, James F.: *See*—
Jasper, Louis J., Jr.; De Santis, Charles M.; and Baxendale, James F., 4,612,476, Cl. 315-3.600.

Baxter, Gordon H. Jigsaw message pads. 4,612,220, Cl. 428-33.000.

Baxter Travenol Laboratories, Inc.: *See*—
Beebe, Susan M.; Dennehey, T. Michael; Kruger, Robert J.; and Zdeb, Brian D., 4,611,643, Cl. 141-311.00R.
Figler, Alan A.; and Selman, John J., 4,612,639, Cl. 371-25.000.

Bayer Aktiengesellschaft: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,612,347, Cl. 525-73.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,612,305, Cl. 514-80.000.

Bayorgeon, Jeffrey T.: *See*—
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,611,787, Cl. 254-267.000.

Bazarnik, Louis M., to Maintenance Technology, Inc. Tamper-resistant, running time maintenance monitor with individualized maintenance message and method. 4,612,623, Cl. 364-569.000.

BBC Aktiengesellschaft Brown, Boveri & Cie.: *See*—
Jahnke, Bernd, 4,611,752, Cl. 228-194.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Nazmy, Mohamed Y.; Rydstad, Hans; Schroder, Gunther; and Singer, Robert, 4,612,062, Cl. 148-11.50N.

BCIRA: *See—*
Emerson, Peter J., 4,611,495, Cl. 73-634.000.
Beal, Dale C., Jr. Lipstick applicator and method for making same. 4,611,611, Cl. 132-88.700.
Beam, John E.: *See—*
Puglia, Wayne J.; Rosa, Donna M.; DeTora, Sigismondo A.; and Beam, John E., 4,612,195, Cl. 426-3.000.
Beamon, William S., III; and Tegge, Edward H., Jr., to General Electric Company. Spatial pixel optimization technique. 4,612,482, Cl. 315-371.000.
Beauchamp, Robert W.; and Springer, George P., to Data General Corp. Floating-point unit constructed of identical modules. 4,612,628, Cl. 364-748.000.
Beavers, Allan E.; and Fulcher, Robert A. Cable anchoring device. 4,611,446, Cl. 52-163.000.
Becher, Charles E.: *See—*
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.
Beck, Hubert W.: *See—*
Hettinger, William P., Jr.; and Beck, Hubert W., 4,612,298, Cl. 502-65.000.
Becker, Rainer: *See—*
Jahn, Dieter; Becker, Rainer; Keil, Michael; and Wuerzer, Bruno, 4,612,036, Cl. 71-91.000.
Beebe, Susan M.; Dennehey, T. Michael; Kruger, Robert J.; and Zdeb, Brian D., to Baxter Travenol Laboratories, Inc. Interlocking fluid transfer device and resulting assembly. 4,611,643, Cl. 141-311.00R.
Beecham Group p.l.c.: *See—*
King, Francis D., 4,612,319, Cl. 514-305.000.
Beers, Howard L., to Tritec, Inc. Manually operated electrical connector for printed circuit boards. 4,611,870, Cl. 339-75.0MP.
Behrens, Ronald L. Connecting system. 4,611,714, Cl. 206-387.000.
Bekiarian, Paul G.; and Gilmore, Paul T., to Du Pont de Nemours, E. I., and Company. Melt-processible tetrafluoroethylene copolymers and process for preparing them. 4,612,357, Cl. 526-247.000.
Belart, Juan, to Alfred Teves GmbH. Hydraulic brake system. 4,611,858, Cl. 303-6.00R.
Bell, Richard E., to Potter & Brumfield, Inc. Method of manufacturing relays. 4,611,392, Cl. 29-602.00R.
Bellamy, John C., to Data General Corporation. Integrated digital network (IDN). 4,612,634, Cl. 370-58.000.
Bellhouse, Christopher P., to Avulunga Pty Ltd. Laryngoscope. 4,611,579, Cl. 128-11.000.
Bellocci, Rio: *See—*
Gourmel, Yves; Pierrel, Michel; and Bellocci, Rio, 4,611,651, Cl. 164-464.000.
Beltran, Fernando, to Raytheon Company. Multi-port radio frequency networks for an antenna array. 4,612,548, Cl. 343-373.000.
Belz, Roland K., to RB Kunststoffpatent- Verwertungs AG. Process for the performance of chemical reactions, more particularly for the manufacture of plastics by means of extruders and apparatus for the process. 4,612,355, Cl. 526-65.000.
Benaben, Patrick; and Tardy, Rene , to Asociation pour la Recherche et le Developpement des Methodes et Processus Industriels. Chromium electroplating trivalent chrominum bath therefore and method of making such bath. 4,612,091, Cl. 204-51.000.
Bencuya, Izak; and Cogan, Adrian I., to GTE Laboratories Incorporated. Method of making junction field effect transistor of static induction type. 4,611,384, Cl. 29-571.000.
Benderev, Theodore V.: *See—*
Grayhack, John T.; and Benderev, Theodore V., 4,611,594, Cl. 128-328.000.
Bengtsson, Borje, to Inter-Ikea AG. Connector for assembling two structural members. 4,611,943, Cl. 403-22.000.
Benjamin, Albert S.: *See—*
Phillips, Gary M.; and Benjamin, Albert S., 4,611,395, Cl. 29-623.200.
Benjamin, James A.: *See—*
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,612,465, Cl. 307-584.000.
Bennett, Terry A.; Zimmerman, William B.; and Maslanka, Michael B., to PPG Industries, Inc. Method and apparatus for shaping glass sheets on shaping molds with flotation blocks. 4,612,031, Cl. 65-106.000.
Bennett, William R.: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.
Bentall, Richard H. C.; Cox, Timothy J.; and Mackie, Ronald D. L., to Bentall, Richard Hugh Cameron. Electrical apparatus for influencing the metabolic characteristics of living systems. 4,611,599, Cl. 128-422.000.
Bentall, Richard Hugh Cameron: *See—*
Bentall, Richard H. C.; Cox, Timothy J.; and Mackie, Ronald D. L., 4,611,599, Cl. 128-422.000.
Benz & Hilgers GmbH: *See—*
Proepper, Wilhelm, 4,611,454, Cl. 53-307.000.
Berendt, Hans-Ulrich: *See—*
Jaeger, Carl A.; Berendt, Hans-Ulrich; and Schafer, Paul, 4,612,016, Cl. 8-543.000.
Bergmann, Gerhard, to Karl Mayer Textilmaschinenfabrik GmbH. Apparatus for the control of the displacement of a guide bar of a warp knitting machine or the like. 4,611,475, Cl. 66-207.000.
Berhaut, Jean-Bernard: *See—*
Fredenucci, Pierre; and Berhaut, Jean-Bernard, 4,612,251, Cl. 428-511.000.
Berner, Godwin; Hoyle, William; and Jack, James, to Ciba-Geigy Corporation. Corrosion-inhibiting coating compositions. 4,612,049, Cl. 106-14.130.
Bernhardson, Gary E. Cross country ski binding. 4,611,822, Cl. 280-615.000.
Bernstein, Ragnar L. H.; and Tiberg, Lars A. Method of preventing corrosion in boiler-plant equipment. 4,611,652, Cl. 165-1.000.
Berry, W. Wes, to Progress Equities Incorporated. Process for increasing the concentration of one component in a multi-component gaseous mixture. 4,612,022, Cl. 55-60.000.
Bertelsen, Iver S.: *See—*
Jorgensen, Hans; Bertelsen, Iver S.; and Jensen, Hans-Erik K., 4,611,786, Cl. 251-118.000.
Bertocchio, Rene; Genest, Bernard; and Mathais, Henri, to Atochem; and Gaz de France. Stable mixtures of chlorofluorocarbons and solvents and their use as heat transfer fluids. 4,612,133, Cl. 252-68.000.
Bertram, Klaus D.: *See—*
Werner, Heinz; Kluting, Bernd A.; Bertram, Klaus D.; and Svoboda, Frantisek, 4,611,778, Cl. 248-429.000.
Bertrand, John, to Wavetek Rockland Scientific, Inc. Decimator employing finite impulse response digital filters. 4,612,625, Cl. 361-724.000.
Besecke, Siegmund; Liebler, Ralf; Hohage, Heinz-Juergen; and Schroeder, Guenter, to Rohm GmbH. UV-absorbing monomer and polymers thereof. 4,612,358, Cl. 526-259.000.
Best, Dieter: *See—*
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.
Bettinger, Antoine: *See—*
Robieux, Jean; Cornillault, Jean; and Bettinger, Antoine, 4,611,917, Cl. 356-37.00S.
Betts, William L.; Smith, Wesley H.; and Deakley, Michael R., to Paradyne Corporation. Frequency shift keyed demodulator. 4,612,509, Cl. 329-50.000.
Biel, Edward N.; and Kirkpatrick, George F., to Union Carbide Corporation. Multilayer food wrap with cling. 4,612,221, Cl. 428-35.000.
Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH. Injection press for use in a transfer molding system. 4,611,983, Cl. 425-544.000.
Bielfeldt, Friedrich B.: *See—*
Kasper, Rolf; and Bielfeldt, Friedrich B., 4,612,081, Cl. 156-583.100.
Bigwood, Michael P.; and Naples, John O., to Rohm and Haas Company. Oxirane resins for enzyme immobilization. 4,612,288, Cl. 435-180.000.
Bildsystem AB: *See—*
Schlyter, Yngve S. G., 4,612,604, Cl. 362-19.000.
Billings, Robert C.: *See—*
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,611,787, Cl. 254-267.000.
Binns, John M.; Caine, Douglas A.; and Spencer, Byron A. T., to Lucas Industries Public Limited Company. Fuel control system for a gas turbine engine. 4,612,616, Cl. 364-431.020.
BioNexus, Inc.: *See—*
Bolduc, Lee R., 4,611,602, Cl. 128-747.000.
Birdwell, J. C., to P & B Industries. Pumping system and method of operating the same. 4,611,973, Cl. 417-342.000.
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, to Max-Planck-Gesellschaft zur Foederung der Wissenschaften. Medicaments containing alpha 1-thymosin fragments and having an immunostimlant action and fragments of alpha 1-thymosin. 4,612,365, Cl. 530-301.000.
Bisker, Richard G.: *See—*
Gerstenmaier, William J.; and Bisker, Richard G., 4,611,729, Cl. 222-75.000.
Bithell, Roger M.: *See—*
Brooks, Edward A., Jr.; and Bithell, Roger M., 4,611,919, Cl. 356-357.000.
Bittner, Norman, to Enviro-Spray Systems Incorporated. Can stuffer and method. 4,611,457, Cl. 53-429.000.
Bivens, David J., to Bivens Winchester Corporation. Top brush construction with inflatable center section. 4,611,359, Cl. 15-97.00B.
Bivens Winchester Corporation: *See—*
Bivens, David J., 4,611,359, Cl. 15-97.00B.
Blain, Edward S., to Sundstrand Corporation. Scroll type compressor or pump with axial pressure balancing. 4,611,975, Cl. 418-5.000.
Blair, Kelvin R.; Furman, Lynn C.; and Knott, David M., to Motorola, Inc. Low-cost power device package with quick-connect terminals and electrically isolated mounting means. 4,611,389, Cl. 29-589.000.
Blanchard, Carl: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, 4,611,987, Cl. 425-131.100.
Bland, Sarah E. L.; and Palmer, Murray H. Contacting a gas and a liquid to remove an unwanted gas. 4,612,021, Cl. 55-53.000.
Blasing, Horst: *See—*
Mahlkow, Hartmut; and Blasing, Horst, 4,611,554, Cl. 118-316.000.
Bliss, William L. Safety lock for rotating machinery. 4,611,703, Cl. 192-135.000.
Block Drug Co., Inc.: *See—*
Yeh, Kuo-Chen; and Synodis, Joseph, 4,612,191, Cl. 424-52.000.
Bloomfield Manufacturing Company, Inc., The: *See—*
McIntosh, Thomas K., 4,611,824, Cl. 280-748.000.

Blum, Yigal: *See—*
Laine, Richard M.; and Blum, Yigal, 4,612,383, Cl. 556-412.000.
Boa A. G. Luzern: *See—*
Marti, Wilhelm; and Burri, Leo, 4,611,827, Cl. 285-3.000.
Board of Regents, University of Texas System: *See—*
Ramamurthy, Rajam S., 4,611,998, Cl. 434-265.000.
Bock, Jan; Downs, Hartley H.; Siano, Donald B.; and Pace, Salvatore J., to Exxon Research and Engineering Co. Novel polymeric foams and foaming compositions. 4,612,332, Cl. 521-65.000.
Boehringer Mannheim GmbH: *See—*
Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, 4,612,313, Cl. 514-255.000.
Boeing Company, The: *See—*
Goldhammer, Mark I.; and Sigalla, Armand, 4,611,773, Cl. 244-35.00R.
Hsu, Grace F.; and Colonel, Richard C., 4,612,236, Cl. 428-216.000.
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. Novel sulfonylureas and sulfonylthioureas, and method of use thereof as herbicides and/or growth regulators. 4,612,037, Cl. 71-92.000.
Boirat, Robert, to Compagnie Industrielle des Telecommincation Cit-Alcatel. Switch for a light guide circuit. 4,611,885, Cl. 350-96.200.
Boire, Daniel C.; Degenford, James E.; and Cohn, Marvin, to Westinghouse Electric Corp. Wideband 180-degree phase shifter bit. 4,612,520, Cl. 333-156.000.
Bolduc, Lee R., to BioNexus, Inc. Instrument and method of tubal insufflation. 4,611,602, Cl. 128-747.000.
Boliden Aktiebolag: *See—*
Holmstrom, Sven A., 4,612,171, Cl. 423-22.000.
Bolz, Gunner: *See—*
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,612,614, Cl. 364-415.000.
Bonardelli, Piergiorgio: *See—*
Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, 4,612,351, Cl. 525-199.000.
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,612,266, Cl. 429-221.000.
Bonfils, Michel R.: *See—*
Aubry, Jacques A.; and Bonfils, Michel R., 4,611,971, Cl. 416-114.000.
Bonjouklian, Rosanne: *See—*
Mynderse, Jon S.; and Bonjouklian, Rosanne, 4,612,330, Cl. 514-557.000.
Bonnefoy, Jean, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Clamping device. 4,611,869, Cl. 339-75.0MP.
Bornstein, Norman S.: *See—*
Peppler, Dennis L.; Zaman, Mohammad F.; Bornstein, Norman S.; and Hartz, Marvin E., 4,611,747, Cl. 228-125.000.
Bosch und Pierburg System Ohg: *See—*
Gilz, Gunter; and Henning, Manfred, 4,612,450, Cl. 307-264.000.
Bossecker, Walter, to Industriewerk Nachf. Seifert & Co. KG. Tilting harness for handling heavy rolls. 4,611,844, Cl. 294-86.410.
Bosshard, Hans; and Greuter, Hans, to Ciba-Geigy Corporation. Process for the preparation of β-(benzothiazolylthio)- and β-(benzimidazolylthio-carboxylic acids. 4,612,378, Cl. 548-170.000.
Bosshard, Werner; and Schroder, Willi, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Cadence regulator for a gas-pressure operated firing weapon. 4,611,525, Cl. 89-193.000.
Boston University, Trustees of: *See—*
Lichtin, Norman N.; and Vijayakumar, Kallambella M., 4,612,096, Cl. 204-157.460.
Bott, Kaspar; Penzel, Erich; and Eckert, Guenter, to Basf Aktiengesellschaft. N-substituted acrylamide and methacrylamide derivatives and their preparation. 4,612,392, Cl. 564-207.000.
Bottenbruch, Ludwig: *See—*
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,612,347, Cl. 525-73.000.
Botvidsson, Lars; and Mund, Konrad, to Siemens Aktiengesellschaft. Bipolar electrode for medical applications. 4,611,604, Cl. 128-784.000.
Bouchette, Michael P.; Van den Akker, Johannes A.; and Watt, William R., to James River-Dixie Northern, Inc. Patterned dry laid fibrous web products of enhanced absorbency. 4,612,231, Cl. 428-167.000.
Boultinghouse, Harold D., to Phillips Petroleum Company. Treatment of polymer using silver. 4,612,248, Cl. 428-419.000.
Bouygues Offshore: *See—*
Saint-M'Leuz, Rene-Pierre, 4,611,952, Cl. 405-224.000.
Bowman, Ronald, to Transamerica Delaval Inc. Disposable transducer systems. 4,611,601, Cl. 128-673.000.
Bowser, Paul A.: *See—*
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.
Box, William A., to United States Steel Corporation. Axisymmetrical separator for separating solids and gas from a fluid medium. 4,612,120, Cl. 210-512.100.
Boyer, Carl W.; and Ennis, Donald H., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,612,181, Cl. 423-593.000.
Boyer, Carl W.: *See—*
Kim, Tai K.; Boyer, Carl W.; MacInnis, Martin B.; and Ennis, Donald H., 4,612,183, Cl. 423-593.000.
Braly, John L.; and Matthewson, Randall W. Container chassis bundling system. 4,611,962, Cl. 410-57.000.
Bramaud, Bernard: *See—*
Hennechart, Jean-Paul; Bramaud, Bernard; and Prat, Francois, 4,612,215, Cl. 427-19.00R.
Brand-Rex Company: *See—*
Johnston, James J., 4,612,412, Cl. 174-65.00R.
Brand, Rolf. Propeller drive assembly. 4,611,774, Cl. 244-54.000.
Brandenstein, Manfred; Edelmann, Ludwig; and Kaschube, Karl-Friedrich, to SKF GmbH. Sealed roller bearing. 4,611,931, Cl. 384-477.000.
Brandi, Roberto: *See—*
Di Tella, Vincenzo; Brandi, Roberto; and Carraro, Roberto, 4,611,550, Cl. 114-230.000.
Brasser, Jan: *See—*
Vos, Cornelis; and Brasser, Jan, 4,611,608, Cl. 131-354.000.
Braun, William A.: *See—*
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.
Breeden, Robert H., to Vickers, Incorporated. Power transmission. 4,611,527, Cl. 91-420.000.
Breen, Thomas J., to Rand McNally & Co. Anti-fraud credit card transaction formset. 4,611,826, Cl. 282-8.00R.
Breitenfellner, Franz, to Ciba-Geigy Corporation. Flame-proofed, reinforced thermoplastic polyester moulding composition containing xonotlite. 4,612,344, Cl. 524-601.000.
Breithaupt, David, to General Electric Co. Imager system for non-destructive profile read-out. 4,612,578, Cl. 358-212.000.
Bridgestone Corporation: *See—*
Ushijima, Takao; and Noguchi, Takeshi, 4,611,782, Cl. 248-562.000.
Brigham and Women's Hospital: *See—*
Szabo, Sandor; Usadel, Klaus W.; and Kessler, Horst, 4,612,302, Cl. 514-11.000.
Brimo, Rene J.; Lariviere, John; and Riedl, James, to Siltec Marketing International Ltd. Silver recovery system. 4,612,102, Cl. 204-228.000.
Britzke, Ingo; and Kramer, Hans, to Gebr. Bode & Co. GmbH. Swingable sliding door for vehicles, particularly automotive vehicles. 4,611,434, Cl. 49-257.000.
Broadbent, Eliot K., to Signetics Corporation. Electrical interconnection for semiconductor integrated circuits. 4,612,257, Cl. 428-620.000.
Brock, Andrew J.; Smith, Edward F.; and Shapiro, Eugene, to Olin Corporation. Copper-silicon-tin alloys having improved cleanability. 4,612,166, Cl. 420-470.000.
Brooks, Edward A., Jr.; and Bithell, Roger M., to Tegal Corporation. Process monitor and method thereof. 4,611,919, Cl. 356-357.000.
Brossmer, Maximilian, to D.I.E.N.E.S. Apparatebau GmbH; and Karl Mayer Textilmaschinenfabrik GmbH. Apparatus for the heat treatment of synthetic yarn. 4,611,410, Cl. 34-41.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Yasui, Tsuneo, 4,611,936, Cl. 400-120.000.
Brower-Berkhoven, Isaac B.: *See—*
Ferguson, James S.; Jackson, J. Eric; and Brower-Berkhoven, Isaac B., 4,611,551, Cl. 114-339.000.
Brown, Boveri & Cie AG: *See—*
Kneisel, Dietmar, 4,612,480, Cl. 315-224.000.
Kruckewitt, Wilfried; and Plettner, Horst, 4,611,634, Cl. 138-31.000.
Brown Boveri Reaktor GmbH: *See—*
Day, Bobby L., 4,612,158, Cl. 376-250.000.
Brown, C. David, to United States of America, Army. Laser projected live fire evasive target system. 4,611,993, Cl. 434-21.000.
Brown, Dennis N., to Northwest Podiatric Laboratories, Inc. Reinforced orthotic insert. 4,611,413, Cl. 36-44.000.
Brown, Hugh M.; and Pasteris, Robert J., to Du Pont de Nemours, E. I., and Company. Herbicidal N-[(4-bromo-6-methoxypyrimidin-2-yl)aminocarbonyl]-2,3-dihydro-(2-methyl)benzo[b]thiophene-7-sulfonamides, 1,1-dioxide. 4,612,035, Cl. 71-90.000.
Brown, Kenneth R.; and Watson, Norman F., to Ferranti plc. Accelerometer system. 4,611,491, Cl. 73-517.00B.
Brown, Richard K.; and Seiferth, Oscar E., to James River - Norwalk, Inc. Package assembly and method for storing and microwave heating of food. 4,612,431, Cl. 219-10.55E.
Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Combinations of sparingly soluble calcium phosphates in slurries and pastes as mineralizers and cements. 4,612,053, Cl. 706-35.000.
Brown, William L., to Brown, William L. Remote control apparatus. 4,611,501, Cl. 74-501.00M.
Brown & Williamson Tobacco Corporation: *See—*
Reynolds, Martin L.; Frank, Dorothy M.; Riehl, Tilford F.; and McMurtrie, Andrew, 4,611,607, Cl. 131-336.000.
Browne, Alan R., to W. R. Grace & Co. Method of forming lithographic print plate utilizing water development of an imaged bi-layer negative-working diazonium material. 4,612,276, Cl. 430-302.000.
Brucker, Jean-Michel; and Estang, Bernard, to Thomson CSF. Inverted Cassegrain antenna for multiple function radars. 4,612,550, Cl. 343-756.000.
Bruff, William V. H.; and Olsen, Leif, to Elkem a/s. Method for continuous production of elongated carbon bodies. 4,612,151, Cl. 264-105.000.
Brunelli, Timothy A.; and Cheresnowsky, Michael J., to GTE Products Corporation. Purification of molybdenum. 4,612,172, Cl. 423-56.000.
Brunet, Patrice, to Poutrait-Morin. End members for bicycle pump connectors. 4,611,828, Cl. 285-3.000.
Brunnee, Curt; Dobberstein, Peter; and Kappus, Gunter, to Finnigan MAT GmbH. Device for adjusting slit widths in spectrometers. 4,612,440, Cl. 250-281.000.

Bruno, David J., Jr.: *See*—
Wong, Vincent Y.; Volker, David A.; Jury, Lydia A.; and Bruno, David J., Jr., 4,612,203, Cl. 426-589.000.

Buch, Donald C., to Eastman Kodak Company. Apparatus and method for forming reproductions with desired margin areas. 4,611,908, Cl. 355-55.000.

Buchegger, Rudolf; and Hirschmanner, Franz, to Voest-Alpine Aktiengesellschaft. Coiler-furnace unit. 4,611,988, Cl. 432-183.000.

Buchholz, Peter; Schopke, Claus-Peter; and Warnecke, Rolf, to Volkswagenwerk Aktiengesellschaft. Expansion hose for reduction of pressure pulsations. 4,611,633, Cl. 138-26.000.

Buchsel, Christian K. E. Passive system for heat transfer. 4,611,654, Cl. 165-104.220.

Budd Company, The: *See*—
Iseler, Kenneth A.; and Wilkinson, Robert E., 4,612,149, Cl. 264-101.000.

Buehler, Richard; Muggli, Jurg; Scheidweiler, Andreas; and Schibli, Eugen, to Cerberus AG. Method of transmitting measuring values in a monitoring system. 4,612,534, Cl. 340-505.000.

Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., to Proizvodstvennoe Obiedinenie "Kievpromarmatura" . Liquid pressure regulator. 4,611,625, Cl. 137-505.250.

Bugge, Hans J., to Nordiskafilt AB. Forming fabric of double-layer type. 4,611,639, Cl. 139-383.00A.

Bugle, Clifford M.: *See*—
Donlevy, Alfred L.; and Bugle, Clifford M., 4,612,160, Cl. 419-2.000.

Buholz, Neal E.: *See*—
Gillard, Calvin W.; Buholz, Neal E.; and Wells, William M., III, 4,611,915, Cl. 356-349.000.

Bullard, Peter H., to Dill Products Incorporated. Modular block and electrical interface assemblies employing same. 4,611,879, Cl. 339-198.00H.

Buran, Ulrich: *See*—
Neuhauser, Hans J.; Buran, Ulrich; and Fischer, Manfred, 4,612,256, Cl. 428-547.000.

Burford, Charles E., to Burford Corp. Spreader for particulate material. 4,611,555, Cl. 118-684.000.

Burford Corp.: *See*—
Burford, Charles E., 4,611,555, Cl. 118-684.000.

Burg, Bernhard: *See*—
Haubold, Herbert; and Burg, Bernhard, 4,612,147, Cl. 264-46.100.

Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, to Siemens Aktiengesellschaft. Gripper for a manipulation device for an industrial robot. 4,611,843, Cl. 294-86.400.

Burgess, Warren C., Jr. Vibratory feeding work station module and system. 4,611,704, Cl. 198-345.000.

Burk, Leslie L. Constant voltage power circuit for a remotely controlled device. 4,612,492, Cl. 320-3.000.

Burke, Edward F.: *See*—
Sequin, Kenneth; and Burke, Edward F., 4,612,535, Cl. 340-539.000.

Burkel, Rainer; Muller, Alfred; Peter, Cornelius; and Schwab, Manfred, to Robert Bosch GmbH. Automotive gearshift jolt minimization system. 4,611,507, Cl. 74-866.000.

Burnham Bros.: *See*—
Burnham, Murry, 4,612,001, Cl. 446-208.000.

Burnham, Murry, to Burnham Bros. Game call. 4,612,001, Cl. 446-208.000.

Burns, William K.: *See*—
Abebe, Moges; Burns, William K.; and Villarruel, Carl A., 4,612,028, Cl. 65-4.200.

Burri, Leo: *See*—
Marti, Wilhelm; and Burri, Leo, 4,611,827, Cl. 285-3.000.

Burroughs Corporation: *See*—
Frandsen, Jorgen, 4,612,592, Cl. 360-106.000.

Burstinghaus, Rainer; Henkes, Erhard; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Oximinophosphoric acid derivatives and their use for controlling pests. 4,612,306, Cl. 514-112.000.

Buser, Kenneth R.; and Rettig, Thomas A., to Du Pont de Nemours, E. I., and Company. Recovery of silver from photographic films by high shear conditions. 4,612,057, Cl. 134-13.000.

Buttner, Peter: *See*—
Ryschka, Martin; Falb, Wolfgang; Buttner, Peter; and Wallroth, Carl-Friedrich, 4,611,590, Cl. 128-203.140.

Buyofsky, Conrad C.: *See*—
Kennette, John W.; Buyofsky, Conrad C.; and Bassett, Alton H., 4,612,226, Cl. 428-134.000.

Buzak, Thomas S., to Tektronix, Inc. Field sequential liquid crystal display with enhanced brightness. 4,611,889, Cl. 350-337.000.

Bychkova, Raisa I.: *See*—
Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., 4,611,625, Cl. 137-505.250.

Byrne, Barry F., to Wormald International Limited. Sprinkler head valve means. 4,611,665, Cl. 169-37.000.

Byrns, James E. Saw blade storage cover. 4,611,713, Cl. 206-349.000.

Cabot Corporation: *See*—
Griebel, Arthur H., III; and Foster, Richard A., 4,612,649, Cl. 373-45.000.
Guzowski, Matthew M.; Sentner, David A.; and Sigworth, Geoffrey K., 4,612,073, Cl. 148-415.000.

Cahart, Olivier F.: *See*—
Robert, Serge; Cahart, Olivier F.; and Le Marchant, Pierre, 4,612,413, Cl. 178-22.080.

Caine, Douglas A.: *See*—
Binns, John M.; Caine, Douglas A.; and Spencer, Byron A. T., 4,612,616, Cl. 364-431.020.

Caldara, Stephen A.: *See*—
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.

Calgon Corporation: *See*—
Jakubowski, John A., 4,612,328, Cl. 514-515.000.

Calligeros, John M.: *See*—
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.

Cammarata, Italo, to Quasar s.r.l. Collapsible vehicle, particularly of the two-wheeled type. 4,611,818, Cl. 280-278.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Neuenschwander, Kent W., 4,612,309, Cl. 514-212.000.

Camprincoli, Pierpaolo: *See*—
Vittone, Andrea; Camprincoli, Pierpaolo; and Grandona, Adriano, 4,612,229, Cl. 428-155.000.

Canadian Patents & Development Limited: *See*—
Corkum, Paul B., 4,612,641, Cl. 372-25.000.

Canon Kabushiki Kaisha: *See*—
Iwashita, Tomonori, 4,611,896, Cl. 354-173.110.
Kasamura, Toshirou; and Sasaki, Nobukazu, 4,611,899, Cl. 355-3.0DD.
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,612,454, Cl. 307-311.000.
Matsuyama, Shinichi, 4,611,898, Cl. 354-484.000.
Sado, Ichiro, 4,611,995, Cl. 434-157.000.
Tsutsui, Shinji, 4,611,967, Cl. 414-411.000.

Cape Cod Research, Inc.: *See*—
Walsh, Myles A.; and Morris, Robert S., 4,612,247, Cl. 428-402.000.

Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, to Montedison S.p.A. Fluoroelastomeric compositions based on vinylidene fluoride, containing small amounts of chlorotrifluoroethylene, having a high adhesion to metals in the vulcanized state. 4,612,351, Cl. 525-199.000.

Carl Kiesow Rohstoffruckewinnung: *See*—
Kiesow, Carl, 4,612,114, Cl. 209-172.000.

Carl Schmale GmbH & Co. KG: *See*—
Schmale, Carl, 4,611,517, Cl. 83-56.000.

Carlson, John H. Non-rotatable tooth for a cylindrical socket bore. 4,611,417, Cl. 37-141.00T.

Carlson, John H.; and Agbay, Anthony J., to Omco Inc. Locking ring assembly. 4,611,478, Cl. 70-164.000.

Carlsson, Per A. E.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

Carlton, James: *See*—
McCaffrey, David J. A.; Rogers, Percy E.; and Carlton, James, 4,612,405, Cl. 568-916.000.

Carolina Plating Works: *See*—
Huffman, Samuel L., 4,611,637, Cl. 139-192.000.

Caroline Christ, Fabrikation chemischer Erzeugnisse: *See*—
Schmidt, Rudolf, 4,611,614, Cl. 134-107.000.

Carraro, Roberto: *See*—
Di Tella, Vincenzo; Brandi, Roberto; and Carraro, Roberto, 4,611,550, Cl. 114-230.000.

Carrier Corporation: *See*—
Zinsmeyer, Thomas M., 4,611,969, Cl. 415-1.000.

Carsonite International Corporation, a Division of AMETEK: *See*—
Schmanski, Donald W., 4,611,949, Cl. 404-9.000.

Carter, Jerie W., Sr., to Mid-Florida Corporation. Gas mixing device and method. 4,611,641, Cl. 141-4.000.

Carter, John L.: *See*—
Weiner, Maurice; Carter, John L.; and Youmans, Robert J., 4,612,455, Cl. 307-419.000.

Cartner, Jack O. Mowing apparatus with improved reversible cutting blade. 4,611,459, Cl. 56-12.700.

Caserta, Anthony L.; Squires, Russell W.; and Szuchy, Nicholas C., to Grumman Aerospace Corporation. Method of making a fiber optic strain sensor. 4,611,378, Cl. 29-407.000.

Cashin, Colin H.; Roberts, Noel A.; and Tong, Brian P., to Hoffmann-La Roche Inc. Imidazole derivatives for treating joint diseases and Wilson's disease. 4,612,324, Cl. 514-400.000.

Cassidy, Bruce A., to Republic Corporation. Apparatus and method for mine installations. 4,611,954, Cl. 405-261.000.

Casteel, Frankie E., to Dover Corporation. Lifting and towing apparatus for large vehicles. 4,611,968, Cl. 414-563.000.

Castillo, Allan P.: *See*—
Rainger, Charles W.; Castillo, Allan P.; and Rogers, John C., 4,612,069, Cl. 148-325.000.

Castillo, David D. Exercise apparatus having a pair of spaced apart rotating discs. 4,611,807, Cl. 272-132.000.

Catania, Samuel J. Hair curler. 4,611,609, Cl. 132-38.00R.

Caterpillar Inc.: *See*—
Cronin, Michael G.; and Cruce, Perry G., 4,611,505, Cl. 74-720.500.

Ceram-Sna Inc.: *See*—
Lalancette, Jean-Marc; and Menard, Hugues, 4,612,178, Cl. 423-338.000.

Cerberus AG: *See—*
Buehler, Richard; Muggli, Jurg; Scheidweiler, Andreas; and Schibli, Eugen, 4,612,534, Cl. 340-505.000.
Ceskoslovenska akademie Ved: *See—*
Drobnik, Jaroslav; and Stepankova, Helena, 4,612,009, Cl. 604-891.000.
Cetnarowski, Robert. Fluid-powered rotary table. 4,611,797, Cl. 269-57.000.
Cha, Chang Y.; and Ricketts, Thomas E., to Occidental Oil Shale, Inc. Two-level, horizontal free face mining system for in situ oil shale retorts. 4,611,856, Cl. 299-2.000.
Chace, David M., to Dresser Industries, Inc. Method and apparatus for natural gamma ray well logging. 4,612,439, Cl. 250-256.000.
Chamberlain, Craig S.: *See—*
Vesley, George F.; Zimmerman, Patrick G.; Chamberlain, Craig S.; and McAllister, Jerome W., 4,612,242, Cl. 428-313.900.
Chavet, Itzhak: *See—*
Ringler, Shlomo; and Chavet, Itzhak, 4,611,411, Cl. 36-7.500.
Chelin, Steven C. Flotation sleeping mattress constructions. 4,611,357, Cl. 5-451.000.
Chen, Cheng-lin; Asars, Juris A.; and Vaerewyck, Eugene G., to Westinghouse Electric Corp. Temperature stabilized Faraday rotator current sensor by thermal mechanical means. 4,612,500, Cl. 324-96.000.
Chen, Kai-Nan. Multi-reinforced construction panel. 4,611,450, Cl. 52-309.400.
Chen, Ying-Chih: *See—*
Liu, Jia-Ming; and Chen, Ying-Chih, 4,612,645, Cl. 372-45.000.
Cheresnowsky, Michael J.: *See—*
Brunelli, Timothy A.; and Cheresnowsky, Michael J., 4,612,172, Cl. 423-56.000.
Chevron Research Company: *See—*
Gibson, James B., 4,612,056, Cl. 134-6.000.
Parker, Phillip H., 4,612,350, Cl. 525-177.000.
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,612,132, Cl. 252-51.50A.
Chiba, Kazumasa; and Tanaka, Kiyoji, to Toray Industries, Inc. Resinous composition. 4,612,346, Cl. 525-66.000.
Chicagoland Processing Corp.: *See—*
Obie, John P.; and Faudree, Thomas L., 4,611,612, Cl. 134-65.000.
Chicopee: *See—*
Kennette, John W.; Buyofsky, Conrad C.; and Bassett, Alton H., 4,612,226, Cl. 428-134.000.
Chicoye, Etzer: *See—*
Goldstein, Henry; Cronan, Charles L.; and Chicoye, Etzer, 4,612,196, Cl. 426-14.000.
Childers, John S.; Pastusek, Paul E.; and Schumacher, Percy W., Jr., to Reed Rock Bit Company. Drill bit having offset roller cutters and improved nozzles. 4,611,673, Cl. 175-340.000.
Children's Medical Center Corporation, The: *See—*
Als, Heidelise; and Zeybekoglu, Annie, 4,611,353, Cl. 2-69.000.
CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Harsanyi, Jozsef; and Papp, Janos, 4,611,764, Cl. 241-39.000.
Chisso Corporation: *See—*
Kaneko, Chikara; Sato, Masayuki; and Ogasawara, Hiromichi, 4,612,379, Cl. 549-274.000.
Cho, Frederick Y.; Joseph, John R.; and Seese, Philip A., to Motorola, Inc. Electron beam/optical hybrid lithographic resist process in acoustic wave devices. 4,612,274, Cl. 430-296.000.
Choksi, Pradip V.: *See—*
Luther, Ronald B.; and Choksi, Pradip V., 4,612,170, Cl. 422-46.000.
Chow, Laurence C.: *See—*
Brown, Walter E.; and Chow, Laurence C., 4,612,053, Cl. 706-35.000.
Chris Kaye Plastics Corp.: *See—*
Kacalieff, Christ D., 4,611,725, Cl. 220-253.000.
Christel, Lee A.: *See—*
Moddel, Garret R.; Christel, Lee A.; and Gibbons, James F., 4,612,408, Cl. 136-244.000.
ChromTech AB: *See—*
Hermansson, Jorgen L. E., 4,612,121, Cl. 210-635.000.
Chromy, Franz, to Hilti Aktiengesellschaft. Motor driven drilling or chipping device. 4,611,670, Cl. 175-116.000.
Chrysler Corporation: *See—*
Kissel, William R., 4,612,638, Cl. 371-15.000.
Chugai Ro Co., Ltd.: *See—*
Shintaku, Yasuyuki, 4,612,045, Cl. 75-68.00R.
Chung, Ding-Yu; Debroy, Tapan K.; and Bartley, Michael L., to BASF Corporation, Inmont Divison. Amine capped aliphatic polyepoxide grind resin for use in cathodic electrocoat processes. 4,612,338, Cl. 523-414.000.
Chung, Kenneth: *See—*
Gordon, Harry W.; and Chung, Kenneth, 4,612,193, Cl. 424-146.000.
Chuohatsujyo Kabushiki Kaisha: *See—*
Nishiyama, Kazuo; Mishima, Yasuhiro; and Kuwayama, Kiyoaki, 4,611,793, Cl. 267-52.000.
Ciba-Geigy Corporation: *See—*
Berner, Godwin; Hoyle, William; and Jack, James, 4,612,049, Cl. 106-14.130.
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,612,037, Cl. 71-92.000.
Bosshard, Hans; and Greuter, Hans, 4,612,378, Cl. 548-170.000.
Breitenfellner, Franz, 4,612,344, Cl. 524-601.000.
Dousse, Roland; and Nebel, Raoul, 4,612,395, Cl. 564-245.000.
Falk, Robert A., 4,612,356, Cl. 526-243.000.
Fasciati, Alfred, 4,612,369, Cl. 534-689.000.
Felix, Franz, 4,612,014, Cl. 8-452.000.
Forgo, Imre; Huwyler, Rene ; and Francois, Jacques, 4,612,209, Cl. 427-54.100.
Jaeger, Carl A.; Berendt, Hans-Ulrich; and Schafer, Paul, 4,612,016, Cl. 8-543.000.
Ravichandran, Ramanathan; and Spivack, John D., 4,612,393, Cl. 564-300.000.
Rosenberger, Siegfried, 4,612,131, Cl. 252-48.600.
Schafer, Paul; Abel, Heinz; Guth, Christian; and Stehlin, Albert, 4,612,352, Cl. 525-404.000.
Spivack, John D.; and Pastor, Stephen D., 4,612,341, Cl. 524-331.000.
Cincinnati Milacron Inc.: *See—*
Piotrowski, Tadeusz W.; and Maack, Horst E., 4,611,934, Cl. 384-517.000.
Cini, Carlo: *See—*
Stefani, Fabrizio; Cini, Carlo; and Alzati, Angelo, 4,612,452, Cl. 307-300.000.
Cirillo, Gianna: *See—*
Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, 4,612,351, Cl. 525-199.000.
Citizen Watch Co., Ltd.: *See—*
Kawahara, Hisashi, 4,611,923, Cl. 368-10.000.
Moriya, Mikio, 4,611,536, Cl. 101-93.210.
Citti, James: *See—*
Wallin, Glenn; Rosenwald, Diane; Citti, James; and Yong, Samuel, 4,612,198, Cl. 426-94.000.
Clarion Co., Ltd.: *See—*
Kobayashi, Yoshiaki; and Yoshida, Hiroshi, 4,611,686, Cl. 181-156.000.
Clark Equipment Company: *See—*
Groothius, Paul B., 4,611,506, Cl. 74-794.000.
Clark, Julie L., to Joule' Inc. Method for manufacturing a fistula. 4,611,382, Cl. 29-450.000.
Clark, Michael R.; Tringali, Dominick; Woodlief, Fredrick E.; and Orosz, Miklos J., to Square D Company. Door mounted circuit breaker operating apparatus. 4,612,424, Cl. 200-50.00A.
Clarke, John E.; Hardesty, Edwin C.; and Reichard, George W., Jr., to AT&T Information Systems; and AT&T Technologies. Communication system cross-connect field power adapter. 4,611,875, Cl. 339-154.00A.
Clegg, John E. Black-water solar disk. 4,611,577, Cl. 126-444.000.
Clegg, John E. Electromagnetic reciprocator. 4,612,467, Cl. 310-27.000.
Clere, Thomas M.: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.
Cline, Carl F., to United States of America, Energy. Fabrication of metallic glass structures. 4,612,161, Cl. 419-3.000.
Cline, Terry W.; Karr, Michael A., III; and Levinson, Frank H., to AT&T Bell Laboratories. Integrated optical circuit package. 4,611,886, Cl. 350-96.200.
Clipper Belt Lacer Company: *See—*
Meulenberg, John H.; and McKeage, Roy A., 4,611,367, Cl. 24-33.00P.
Clough, John M., to Imperial Chemical Industries PLC. Heterocyclic compounds. 4,612,381, Cl. 549-560.000.
Coal Industry (Patents) Ltd.: *See—*
McCaffrey, David J. A.; Rogers, Percy E.; and Carlton, James, 4,612,405, Cl. 568-916.000.
Coble, Gary L. Diffuser system for annealing furnace with water cooled base. 4,611,791, Cl. 266-263.000.
Coetzer, Johan: *See—*
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,612,266, Cl. 429-221.000.
Cogan, Adrian I.: *See—*
Bencuya, Izak; and Cogan, Adrian I., 4,611,384, Cl. 29-571.000.
Cogent Ltd.: *See—*
Holmes, John P.; and Froud, Roderick W., 4,612,104, Cl. 204-272.000.
Cohen, Donald M., to Cordis Corporation. Optical fiber pressure transducer. 4,611,600, Cl. 128-667.000.
Cohen, Eli. Shoe sole with deflective mid-sole. 4,611,412, Cl. 36-28.000.
Cohen, Morton. Sharpening system and related method. 4,611,437, Cl. 51-181.00R.
Cohn, Marvin: *See—*
Boire, Daniel C.; Degenford, James E.; and Cohn, Marvin, 4,612,520, Cl. 333-156.000.
Cohn, Robert J.; and Sudimak, Michael J., to Intermetro Industries Corporation. Device for storing a plurality of dishes or the like in a plurality of stacks. 4,611,718, Cl. 211-49.100.
Colcher, David: *See—*
Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,612,282, Cl. 435-68.000.
Cole Sewell Corporation: *See—*
Ralph, James L., 4,611,452, Cl. 52-455.000.
Coleman Company, Inc., The: *See—*
Collins, William J., 4,612,609, Cl. 362-306.000.
Coleman, Robert D.; and McAlister, Michael P., to CPC International Inc. Plasmids containing a gene coding for a thermostable pullulanase and pullulanase-producing strains of *Escherichia coli* and *Bacillus subtilis* containing the plasmids. 4,612,287, Cl. 435-172.300.

Coleman, William M., III, to Dow Chemical Company, The. Novel catalyst for producing relatively narrow molecular weight distribution olefin polymers. 4,612,300, Cl. 502-113.000.

Collette, Robert J., to Combustion Engineering, Inc. Restrictor application for in line gas entrained solids redistribution. 4,611,543, Cl. 110-263.000.

Collins, William J., to Coleman Company, Inc., The. Light assembly with removable bulb. 4,612,609, Cl. 362-306.000.

Colonel, Richard C.: *See—*
Hsu, Grace F.; and Colonel, Richard C., 4,612,236, Cl. 428-216.000.

Colquhoun, Howard M.; and Lewis, David F., to Imperial Chemical Industries PLC. Purification of 4-fluoro-4'-hydroxybenzophenone. 4,612,399, Cl. 568-324.000.

Columbia University in the City of New York, The Trustees of: *See—*
Fox, Charles L., Jr.; and Modak, Shanta M., 4,612,337, Cl. 523-113.000.

Combustion Engineering Co., Inc.: *See—*
Guerrero, Hector N., 4,611,813, Cl. 277-1.000.

Combustion Engineering, Inc.: *See—*
Alexander, M. Grayson; and Riley, Brian, 4,612,263, Cl. 429-104.000.
Collette, Robert J., 4,611,543, Cl. 110-263.000.

Communications Patents Limited: *See—*
Gargini, Eric J.; and Kalanit, Gideon, 4,612,519, Cl. 333-103.000.

Compagnie Francaise d'Entreprises Metalliques CFEM: *See—*
Saint-M'Leuz, Rene-Pierre, 4,611,952, Cl. 405-224.000.

Compagnie General pour les Developpements Operationnels des Richesses Sous-Marines CG Doris: *See—*
Saint-M'Leuz, Rene-Pierre, 4,611,952, Cl. 405-224.000.

Compagnie Generale d'Electricite: *See—*
Robieux, Jean; Cornillault, Jean; and Bettinger, Antoine, 4,611,917, Cl. 356-37.00S.

Compagnie Industrielle des Telecommincation Cit-Alcatel: *See—*
Boirat, Robert, 4,611,885, Cl. 350-96.200.

Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Bonnefoy, Jean, 4,611,869, Cl. 339-75.0MP.

Compton, Stephen F.; and Thomas, Richard D., to W. R. Grace & Co., Cryovac Div. Bag dispensing package. 4,611,728, Cl. 221-63.000.

Concord, Inc.: *See—*
Nickeson, James L.; and Walko, John A., 4,611,545, Cl. 111-52.000.

Connolly, John F.; Thrash, Robert J.; and Kretchmer, Richard A., to Amoco Corporation. Stabilization of sulfur dioxide solutions containing lithium perchlorate and a tetraalkylammonium perchlorate. 4,612,265, Cl. 429-196.000.

Conoco Inc.: *See—*
Doerr, Richard E., 4,611,955, Cl. 406-31.000.
Gergely, John S., 4,612,456, Cl. 307-425.000.

Continental Laser Corporation: *See—*
Peterson, Royal D.; and Jones, Ronald E., 4,612,648, Cl. 372-109.000.

Contraves GmbH: *See—*
Kohler, Franz, 4,612,553, Cl. 346-1.100.

Cook, David L. Method of mounting an appliance to a bracket. 4,612,603, Cl. 361-419.000.

Cooke, Victor F. G.: *See—*
Ginter, James W.; Thorpe, Donald H.; and Cooke, Victor F. G., 4,612,254, Cl. 428-531.000.

Coombs, Daniel M.: *See—*
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., 4,612,110, Cl. 208-251.00H.

Cooper, Arthur J.: *See—*
Currie, Janie K.; Cooper, Arthur J.; and Pesa, Frederick A., 4,612,301, Cl. 502-154.000.

Cooper Industries, Inc.: *See—*
Gurevich, Leon; and Spaunhorst, Vernon, 4,612,529, Cl. 337-255.000.

Cooper, Richard B.: *See—*
Macdougall, John D.; and Cooper, Richard B., 4,612,563, Cl. 357-40.000.

Corban International, Ltd.: *See—*
Thomas, Harold K., 4,612,168, Cl. 420-587.000.

Cordis Corporation: *See—*
Cohen, Donald M., 4,611,600, Cl. 128-667.000.

Corkum, Paul B., to Canadian Patents & Development Limited. Infrared pulse compression. 4,612,641, Cl. 372-25.000.

Cornillault, Jean: *See—*
Robieux, Jean; Cornillault, Jean; and Bettinger, Antoine, 4,611,917, Cl. 356-37.00S.

Cortese, Richard: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,612,186, Cl. 424-15.000.

Cosden Technology, Inc.: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, 4,611,987, Cl. 425-131.100.

Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, to Rhone-Poulenc Sante. Process for the preparation of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadienone. 4,612,401, Cl. 568-362.000.

Costello, Scott M.; and Vukovich, William J., to General Motors Corporation. Self-adjusting magnetic sensor. 4,612,501, Cl. 324-208.000.

Cotter, Patrick J., to Ford Motor Company. Automotive seat belt retractor with anti-cinch device. 4,611,770, Cl. 242-107.40D.

Coutcher, Halsey. Collapsible fishing rod holder. 4,611,427, Cl. 43-21.200.

Covell, L. David: *See—*
Klieman, Charles H.; and Densmore, Richard M., 4,611,595, Cl. 128-334.00R.

Covey, Ray M., Jr. Vaporizer/carburetor. 4,611,567, Cl. 123-545.000.

Cowell, Mark: *See—*
Lares, Joseph P.; and Cowell, Mark, 4,611,990, Cl. 433-129.000.

Cowhey, Thomas M.: *See—*
Van Iperen, Willem H. P.; and Cowhey, Thomas M., 4,611,961, Cl. 410-20.000.

Cowhig, William M.: *See—*
Pryor, Richard L.; and Cowhig, William M., 4,612,618, Cl. 364-490.000.

Cox, James P. Nozzle. 4,611,759, Cl. 239-229.000.

Cox, Timothy J.: *See—*
Bentall, Richard H. C.; Cox, Timothy J.; and Mackie, Ronald D. L., 4,611,599, Cl. 128-422.000.

CPC International Inc.: *See—*
Coleman, Robert D.; and McAlister, Michael P., 4,612,287, Cl. 435-172.300.

CPT Corporation: *See—*
Storberg, David G., 4,612,481, Cl. 315-370.000.

Craig Medical Products Limited: *See—*
Steer, Peter L., 4,611,785, Cl. 251-4.000.

Cranston, Albert E., III: *See—*
Kudlicka, Mark L.; and Cranston, Albert E., III, 4,611,534, Cl. 100-26.000.

Cranston Machinery Co., Inc.: *See—*
Kudlicka, Mark L.; and Cranston, Albert E., III, 4,611,534, Cl. 100-26.000.

Cravens, James E.: *See—*
Luecking, R. Kent; and Cravens, James E., 4,611,734, Cl. 224-42.420.

Crawford, Keith R.: *See—*
McCormick, Peter E.; Edwards, Rick C.; and Crawford, Keith R., 4,611,377, Cl. 29-407.000.

Crites, Allan B., to Arlasky, David. Tamper resistant lock bolt assembly. 4,611,477, Cl. 70-416.000.

Cronan, Charles L.: *See—*
Goldstein, Henry; Cronan, Charles L.; and Chicoye, Etzer, 4,612,196, Cl. 426-14.000.

Cronin, Michael G.; and Cruce, Perry G., to Caterpillar Inc. Vehicular differential drive assembly and mounting means therefor. 4,611,505, Cl. 74-720.500.

Croon & Lucke Maschinenfabrik GmbH & Co. KG: *See—*
Wedler, Klaus, 4,611,707, Cl. 198-468.200.

Croudace, Michael C.: *See—*
Landry, James F.; Croudace, Michael C.; On, Harry P., Jr.; and Shen, Sidney Y., 4,612,130, Cl. 252-39.000.

Crozier, Peter A.: *See—*
Ackert, Robert J.; Witty, Robert W.; and Crozier, Peter A., 4,611,789, Cl. 266-81.000.

Cruce, Perry G.: *See—*
Cronin, Michael G.; and Cruce, Perry G., 4,611,505, Cl. 74-720.500.

Culp, Charles H., to Honeywell Inc. Energy management load leveling. 4,612,619, Cl. 364-492.000.

Curran, John W., to Exxon Production Research Co. Acoustic logging in low velocity formations. 4,611,685, Cl. 181-102.000.

Currie, Janie K.; Cooper, Arthur J.; and Pesa, Frederick A., to Standard Oil Company, The. Metal coordination complexes of heteropolyacids as catalysts for alcohol conversion. 4,612,301, Cl. 502-154.000.

Cuscurida, Michael; and Klein, Howard P., to Texaco, Inc. Polyoxyalkylene polyether amino alcohols containing a tertiary hydroxyl group and flexible polyurethanes made therefrom. 4,612,335, Cl. 521-167.000.

Cutting Room Appliances Corp.: *See—*
Hoffman, Michael E.; and Stevenson, Roy, 4,611,798, Cl. 270-31.000.

CX/Oxytech, Inc.: *See—*
Elfline, Geraldine S., 4,612,125, Cl. 210-724.000.

D.I.E.N.E.S. Apparatebau GmbH: *See—*
Brossmer, Maximilian, 4,611,410, Cl. 34-41.000.

D. L. Auld Company, The: *See—*
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,612,075, Cl. 156-242.000.

Dacomed Corporation: *See—*
Walsh, John J.; and Walsh, Michael W., 4,612,664, Cl. 381-70.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.

Dai Nihon Ink Kagaku Kogyo Kabushiki Kaisha: *See—*
Tsuji, Shuya; Kawabata, Yoshichika; and Yamamoto, Rokuro, 4,611,980, Cl. 425-435.000.

Dai, Shenghong A.; and Sherwood, Philip W., to Dow Chemical Company, The. Process for electrodeposition using azetidinedione compounds as crosslinkers. 4,612,098, Cl. 204-181.700.

Dai, Shenghong A., to Dow Chemical Company, The. Tris-azetidinedione derivative 1,3,5-triazin-2,4,6-triones. 4,612,374, Cl. 544-222.000.

Daiawa Kobunshi Kogyo Co., Ltd.: *See—*
Kawabata, Kazuhisa; Kumabe, Hirohide; and Kawai, Shunzo, 4,612,152, Cl. 264-136.000.

Daimler-Benz Aktiengesellschaft: *See—*
Kurth, Hermann; and Robitschko, Peter, 4,612,530, Cl. 340-63.000.

Dallas, Donald W. Suction engaging x-ray cassette container. 4,612,661, Cl. 378-177.000.

Daly, John W.: *See*—
Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., 4,612,315, Cl. 514-263.000.

Dan Mamtirim: *See*—
Koresh, Peretz, 4,611,760, Cl. 239-233.000.

Dane, John A. Support panels for parabolic reflectors. 4,611,891, Cl. 350-613.000.

Danfoss A/S: *See*—
Jorgensen, Hans; Bertelsen, Iver S.; and Jensen, Hans-Erik K., 4,611,786, Cl. 251-118.000.

Dang, Vu A.: *See*—
Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., 4,612,143, Cl. 558-282.000.

Da Silva, Jean P. X.; and Guiglini, Jean-Yves M., to U.S. Philips Corporation. Memory arrangement with ordered writing particularly intended for cooperation with a radar image display unit. 4,612,544, Cl. 343-5.0DP.

Data General Corp.: *See*—
Beauchamp, Robert W.; and Springer, George P., 4,612,628, Cl. 364-748.000.
Bellamy, John C., 4,612,634, Cl. 370-58.000.
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.

Daud, Taher: *See*—
Morrison, Andrew D.; and Daud, Taher, 4,612,072, Cl. 148-175.000.

Davenport, James W.; and Perry, Thomas H., Jr., to Dow Chemical Company, The. Electrical conditioning of a platinum electrode useful in measurement in hypochlorite. 4,612,094, Cl. 204-141.500.

Davis, Alfred L., to Sheller-Globe Corporation. Fiber web for compression molding structural substrates for panels. 4,612,224, Cl. 428-109.000.

Davis, Christopher K.; Stein, Paul J.; and Ball, Diana M., to U.S. Philips Corporation. Multiple-access communications system. 4,612,637, Cl. 370-95.000.

Davis, Dean T.; and Hays, Kenneth E., to IRD Mechanalysis, Inc. Apparatus for collecting scheduled maintenance data. 4,612,620, Cl. 364-551.000.

Davis, Kirk E.: *See*—
DiBiase, Stephen A.; Davis, Kirk E.; and Tagliamonte, Thomas A., 4,612,129, Cl. 252-33.600.

Davis, Thomas: *See*—
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., 4,612,110, Cl. 208-251.00H.

Dawes, Dennis K., to American Monitor Corporation. Method and apparatus for mixing serum and reagents for chemical analysis. 4,612,291, Cl. 436-174.000.

Daws, Bryan E., to Phoenix Newspapers, Inc. Display stand. 4,611,865, Cl. 312-114.000.

Day, Bobby L., to Brown Boveri Reaktor GmbH. Process for controlling leaks between the primary and secondary coolant loops of a pressurized water reactor system. 4,612,158, Cl. 376-250.000.

Dayco Corporation: *See*—
Miranti, Joseph P., Jr., 4,612,005, Cl. 474-201.000.

Deakley, Michael R.: *See*—
Betts, William L.; Smith, Wesley H.; and Deakley, Michael R., 4,612,509, Cl. 329-50.000.

Dean, Richard T., to Mallinckrodt, Inc. Methods and compositions for enhancing magnetic resonance imaging. 4,612,185, Cl. 424-2.000.

De Boks, Christiaan, to M & C Products B.V. Tubular connecting device. 4,611,836, Cl. 285-158.000.

DeBona, Bruce T.: *See*—
Lai, Yu-Chin; DeBona, Bruce T.; and Prevorsek, Dusan C., 4,612,362, Cl. 528-190.000.

DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., to Getty Oil Company; and Reed Lignin, Inc. Oxidized alkali lignins and their use in enhanced oil recovery. 4,611,659, Cl. 166-274.000.

Debroy, Tapan K.: *See*—
Chung, Ding-Yu; Debroy, Tapan K.; and Bartley, Michael L., 4,612,338, Cl. 523-414.000.

Deere & Company: *See*—
Anstey, Henry D.; and Viaud, Jean, 4,611,535, Cl. 100-43.000.
Hall, James W.; Popelier, Maurice A.; and Leemans, Daniel L., 4,611,605, Cl. 130-23.000.
Hall, James W.; and Popelier, Maurice A., 4,611,606, Cl. 130-23.000.
Wohlford, William P.; and Orlandea, Nicolae V., 4,611,860, Cl. 305-43.000.

Defeuilley, Jean-Pierre; and Nguyen-van-Nguyen, Jean, to U.S. Philips Corporation. Rapidly tunable frequency synthesizer with oscillator frequency presetting means. 4,612,516, Cl. 331-11.000.

DeForest, Sherman E.: *See*—
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,612,614, Cl. 364-415.000.

DeFreitas, Richard E., to Analog and Digital Systems, Inc. Digital encoding circuitry. 4,612,654, Cl. 375-30.000.

Degenford, James E.: *See*—
Boire, Daniel C.; Degenford, James E.; and Cohn, Marvin, 4,612,520, Cl. 333-156.000.

Degn, Kaj H., to O.G. Hoyer A/S. Method of producing frozen block bodies. 4,611,468, Cl. 62-71.000.

Degner, Dieter; Steckhan, Eberhard; and Grosse-Brinkhaus, Karl H., to BASF Aktiengesellschaft. Preparation of aromatic carboxylates. 4,612,092, Cl. 204-59.00R.

De Howitt, Jack R., to Du Pont de Nemours, E. I., and Company. Process for combining and codrawing antistatic filaments with undrawn nylon filaments. 4,612,150, Cl. 264-103.000.

Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, to International Remote Imaging Systems, Inc. Method of analyzing particles in a fluid sample. 4,612,614, Cl. 364-415.000.

Del Laboratories, Inc.: *See*—
Gordon, Harry W.; and Chung, Kenneth, 4,612,193, Cl. 424-146.000.

Delamere, Peter A. Sign construction. 4,611,420, Cl. 40-610.000.

DellaVecchia, Michael P.; Mackey, Joseph E.; and Steinberg, Albert H., to Allied Corporation. Fiber reinforced multi-ply stampable thermoplastic sheet. 4,612,238, Cl. 428-228.000.

De Long, Ronald B., to Westinghouse Electric Corp. Post cover mounting clip. 4,611,448, Cl. 52-239.000.

den Hollander, Willem; and Hartmeier, Werner N., to RCA Corporation. Burst-to-line-locked clock digital video signal sample rate conversion apparatus. 4,612,568, Cl. 358-19.000.

Denki Kagaku Kogyo K. K.: *See*—
Maeda, Tetsuro; Onaya, Kyoji; and Okamoto, Akihiro, 4,612,253, Cl. 428-521.000.

Dennehey, T. Michael: *See*—
Beebe, Susan M.; Dennehey, T. Michael; Kruger, Robert J.; and Zdeb, Brian D., 4,611,643, Cl. 141-311.00R.

Densmore, Richard M.: *See*—
Klieman, Charles H.; and Densmore, Richard M., 4,611,595, Cl. 128-334.00R.

De Santis, Charles M.: *See*—
Jasper, Louis J., Jr.; De Santis, Charles M.; and Baxendale, James F., 4,612,476, Cl. 315-3.600.

De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., to AGFA-GEVAERT N.V. Toner dispensing control. 4,611,905, Cl. 355-14.00D.

Desmonts, Georges; and Remington, Jack S., to Palo Alto Medical Foundation Research Institute. Immunoassay for detecting immunoglobulins and test kit. 4,612,281, Cl. 435-7.000.

Despres, Dominique, to Valeo. Clutch release bearing and corresponding clutch release yoke. 4,611,700, Cl. 192-98.000.

Deters, Joseph C.: *See*—
Wong, Patrick S. L.; Barclay, Brian; Deters, Joseph C.; and Theeuwes, Felix, 4,612,008, Cl. 604-892.000.

DeTora, Sigismondo A.: *See*—
Puglia, Wayne J.; Rosa, Donna M.; DeTora, Sigismondo A.; and Beam, John E., 4,612,195, Cl. 426-3.000.

DeVries, James M., to United States of America, Navy. Integrated high-gain active radar augmentor. 4,612,543, Cl. 343-5.00R.

Devron Engineering Ltd.: *See*—
Hauptmann, Edward G., 4,612,089, Cl. 162-336.000.

Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., to Alcan International Limited. Aluminium reduction cells. 4,612,103, Cl. 204-243.00R.

Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., to McKay International Engineers. Heavy transport bolster construction. 4,611,817, Cl. 280-145.000.

Diamond, Steven E.: *See*—
Muccigrosso, Deborah A.; Mares, Frank; Diamond, Steven E.; and Solar, Jeffrey P., 4,612,402, Cl. 568-408.000.

DiBiase, Stephen A.; Davis, Kirk E.; and Tagliamonte, Thomas A., to Lubrizol Corporation, The. Sulfur-containing compositions, and additive concentrates and lubricating oils containing same. 4,612,129, Cl. 252-33.600.

Dickerson, Willard A., to United States of America, Agriculture. Boll weevil trap. 4,611,425, Cl. 43-121.000.

Diego, Dennis F. Articulating joint for folding tubular sections. 4,611,945, Cl. 403-61.000.

Diehl GmbH & Co.: *See*—
Stessen, Lothar, 4,611,772, Cl. 244-3.160.

Diesel Kiki Co., Ltd.: *See*—
Miyanaga, Choshichi; Sakurai, Yoshihiko; Iida, Katsumi; and Hagiwara, Akihiro, 4,611,755, Cl. 236-13.000.
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,611,977, Cl. 418-76.000.

Dill Products Incorporated: *See*—
Bullard, Peter H., 4,611,879, Cl. 339-198.00H.

Dilling, Peter: *See*—
Miller, James E., Jr.; and Dilling, Peter, 4,612,051, Cl. 106-30.000.

Dillon, Edward T.; and Edmonds, David L., to NL Industries, Inc. Method for controlling foaming in delayed coking processes. 4,612,109, Cl. 208-131.000.

Dimanshteyn, Felix. Articles for providing fire protection. 4,612,239, Cl. 428-246.000.

Dingwall, Andrew G. F.; and Zazzu, Victor, to RCA Corporation. Intermeshed resistor network for analog to digital conversion. 4,612,531, Cl. 340-347.0AD.

Director General of Agency of Industrial Science & Technology: *See*—
Hitotsuyanagi, Hajime; Igarashi, Tadashi; Ishii, Masayuki; and Kobayashi, Tadakazu, 4,612,559, Cl. 357-2.000.

Di Tella, Vincenzo; Brandi, Roberto; and Carraro, Roberto, to Tecnomare S.p.A. System for mooring tankers to a fixed structure. 4,611,550, Cl. 114-230.000.

Dixon, Carl R.; and Anschultz, Jackie R. Gravity-feed grain spreader. 4,611,965, Cl. 414-299.000.

Dobashi, Toshio: *See*—
Hara, Masahara; and Dobashi, Toshio, 4,611,897, Cl. 354-475.000.

Dobberstein, Peter: *See*—
Brunnee, Curt; Dobberstein, Peter; and Kappus, Gunter, 4,612,440, Cl. 250-281.000.
Dr. Johannes Heidenhain GmbH: *See*—
Spies, Alfons, 4,612,502, Cl. 324-208.000.
Dr. M, Dr. Muller AG: *See*—
Alt, Christian; Kober, Arthur; and Kiesewetter, Willi, 4,612,126, Cl. 210-787.000.
Doctor, Richard D.: *See*—
Harkness, John B. L.; Doctor, Richard D.; and Wingender, Ronald J., 4,612,175, Cl. 423-235.000.
Doering, Garry L. Pitless adaptor by-pass. 4,611,657, Cl. 166-88.000.
Doerr, Richard E., to Conoco Inc. Slurry pump tram control apparatus. 4,611,955, Cl. 406-31.000.
Doi, Ryouta: *See*—
Tsukui, Tsutomu; Shimizu, Toshio; and Doi, Ryouta, 4,612,261, Cl. 429-13.000.
Dominguez, Aurelio D., to Inquimet Sociedad Anonima Industrial Comercial y Agraria. Evaporators. 4,612,086, Cl. 159-6.100.
Donaldson Company, Inc.: *See*—
Eidsvoog, Frank H.; and Warren, Sean T., 4,611,627, Cl. 137-588.000.
Donlevy, Alfred L.; and Bugle, Clifford M., to Dynamet, Inc. Porous metal coating process and mold therefor. 4,612,160, Cl. 419-2.000.
Donn Incorporated: *See*—
Worley, Robert F., 4,611,453, Cl. 52-667.000.
Dorazio, Raymond E.: *See*—
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.
Dorina Nahmaschinen GmbH: *See*—
Holl, Helmar, 4,611,548, Cl. 112-311.000.
Doring, Joachim: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,612,347, Cl. 525-73.000.
Dormichian, Bahram: *See*—
Gosch, Hans-Werner; Franke, Karl; Kohlbecker, Jorg; and Dormichian, Bahram, 4,612,173, Cl. 423-170.000.
Dortu, Jean-Marc; and Kohn, Erhard, to Thomson-CSF. Field effect transistor operating in the enhancement mode. 4,612,560, Cl. 357-22.000.
Dothan, Felix, to Yale University. Triggering device for a vacuum arc in a plasma centrifuge. 4,612,477, Cl. 315-111.210.
Dousse, Roland; and Nebel, Raoul, to Ciba-Geigy Corporation. Process for the production of N-(2-methyl-4-chlorophenyl)-formamidine derivatives. 4,612,395, Cl. 564-245.000.
Dover Corporation: *See*—
Casteel, Frankie E., 4,611,968, Cl. 414-563.000.
Dow Chemical Company, The: *See*—
Andrews, Philip S.; and Onder, Kemal, 4,612,353, Cl. 525-432.000.
Coleman, William M., III, 4,612,300, Cl. 502-113.000.
Dai, Shenghong A.; and Sherwood, Philip W., 4,612,098, Cl. 204-181.700.
Dai, Shenghong A., 4,612,374, Cl. 544-222.000.
Davenport, James W.; and Perry, Thomas H., Jr., 4,612,094, Cl. 204-141.500.
Durvasula, Visweswara R., 4,612,400, Cl. 568-333.000.
Hefner, Robert E., Jr., 4,612,359, Cl. 528-97.000.
Heinemeyer, Ben W.; and Tatum, Sammy D., 4,612,156, Cl. 264-176.00R.
Hess, Roland H. P., 4,612,345, Cl. 524-733.000.
Kurfman, Virgil B., 4,612,216, Cl. 427-250.000.
Langhorst, Marsha L., 4,612,019, Cl. 55-16.000.
Pierce, Richard A.; and Jernigan, Robert T., 4,612,134, Cl. 252-75.000.
Renga, James M., 4,612,386, Cl. 560-86.000.
Sun, Yun C., 4,612,348, Cl. 525-86.000.
Dowa Co., Ltd.: *See*—
Miyahara, Kingo, 4,612,199, Cl. 426-237.000.
Downing, Robert D., to General Electric Company. Increased efficacy arc tube for a high intensity discharge lamp. 4,612,475, Cl. 313-640.000.
Downs, Hartley H.: *See*—
Bock, Jan; Downs, Hartley H.; Siano, Donald B.; and Pace, Salvatore J., 4,612,332, Cl. 521-65.000.
Dr.Ing. h.c.F. Porsche AG: *See*—
Trenkler, Werner, 4,611,849, Cl. 296-201.000.
Dr.Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Lehmann, Ulrich, 4,611,698, Cl. 192-30.00W.
Dragerwerk AG: *See*—
Pasternack, Adalbert, 4,611,589, Cl. 128-202.260.
Dragerwerk Aktiengesellschaft: *See*—
Pasternack, Adalbert, 4,611,628, Cl. 137-509.000.
Ryschka, Martin; Falb, Wolfgang; Buttner, Peter; and Wallroth, Carl-Friedrich, 4,611,590, Cl. 128-203.140.
Drake, Anthony F. Blade and process of making same. 4,611,400, Cl. 30-353.000.
Draper, Robert B.: *See*—
Hed, Jon E.; and Draper, Robert B., 4,611,661, Cl. 166-339.000.
Dresser Industries, Inc.: *See*—
Chace, David M., 4,612,439, Cl. 250-256.000.
Gerstenmaier, William J.; and Bisker, Richard G., 4,611,729, Cl. 222-75.000.
Dreyer, Claude, to S.I.C.A.R.T. (Societe Indusrielle de Construction d'Accessories Radio et Television. Arrangement for the omnidirectional orientation of an antenna. 4,612,551, Cl. 343-765.000.
Drobnik, Jaroslav; and Stepankova, Helena, to Ceskoslovenska akademie Ved. Biodegradable implant and a method for preparation thereof. 4,612,009, Cl. 604-891.000.
Druz, Jacques: *See*—
Nicco, Adrien; Hubert, Jerome; Druz, Jacques; and Lambla, Morand, 4,612,349, Cl. 525-117.000.
D'Silva, Themistocles D., to Union Carbide Corporation. Biocidal sulfur-containing bis-imino carbamate compounds. 4,612,326, Cl. 514-443.000.
Du Pont Canada Inc.: *See*—
Russell, Charles G., 4,612,382, Cl. 556-173.000.
Wong, Chun S.; and Zelonka, Ronald A., 4,612,155, Cl. 264-176.00R.
Dubois, Lawrence H.; and Nuzzo, Ralph G., to AT&T Laboratories. Aliphatic aromatization with intemetallic Group VIII–IIIA, IVA catalyst. 4,612,407, Cl. 585-434.000.
Dudek, D'Ann; and Dudek, Wilma. Holder for working with computer print-outs. 4,611,719, Cl. 211-50.000.
Dudek, Wilma: *See*—
Dudek, D'Ann; and Dudek, Wilma, 4,611,719, Cl. 211-50.000.
Duff, Thomas A., to Wisconsin Alumni Research Foundation. Vertebral clamp. 4,611,582, Cl. 128-69.000.
Duplessy, Herve : *See*—
Duplessy, Patrice; and Duplessy, Herve , 4,611,419, Cl. 38-21.000.
Duplessy, Patrice; and Duplessy, Herve . Trouser press. 4,611,419, Cl. 38-21.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bekiarian, Paul G.; and Gilmore, Paul T., 4,612,357, Cl. 526-247.000.
Brown, Hugh M.; and Pasteris, Robert J., 4,612,035, Cl. 71-90.000.
Buser, Kenneth R.; and Rettig, Thomas A., 4,612,057, Cl. 134-13.000.
De Howitt, Jack R., 4,612,150, Cl. 264-103.000.
Frankenburg, Peter E., 4,612,237, Cl. 428-219.000.
German, Randall M.; Lall, Chaman; and Madan, Deepak S., 4,612,048, Cl. 75-246.000.
Howard, Edward G., Jr., 4,612,241, Cl. 428-294.000.
Moore, Earl P., Jr., 4,612,368, Cl. 534-578.000.
Zimmerman, Joseph, 4,612,154, Cl. 264-176.200.
Durhman, Neil E., to General Feeds, Inc. Bag loading device for flowable substances. 4,611,642, Cl. 141-114.000.
Durrant, James A.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.
Durvasula, Visweswara R., to Dow Chemical Company, The. Autoxidation of bis(ortho dialkyl-phenoxy)benzophenones. 4,612,400, Cl. 568-333.000.
Dyck, Rudolph H., to Fairchild Camera & Instrument Corporation. Mask programmable charge coupled device transversal filter. 4,612,522, Cl. 333-165.000.
Dyllick-Brenzinger, Rainer, to BASF Aktiengesellschaft. Liquid dye formulations containing organic carbonates. 4,612,015, Cl. 8-527.000.
Dynamet, Inc.: *See*—
Donlevy, Alfred L.; and Bugle, Clifford M., 4,612,160, Cl. 419-2.000.
E-Systems, Inc.: *See*—
Ishman, Neal H.; and Alderson, William S., 4,612,575, Cl. 358-160.000.
Livingston, William D.; and Mack, Wayne A., 4,612,653, Cl. 375-23.000.
Eagle Electric Mfg. Co. Inc.: *See*—
Munroe, Ronald G., 4,612,423, Cl. 200-16.00R.
Eames, Robert J.; and Johnson, Richard E., to GTE Products Corporation. Integrated circuit package. 4,611,398, Cl. 29-841.000.
Eastman Kodak Company: *See*—
Buch, Donald C., 4,611,908, Cl. 355-55.000.
Lau, Philip; and Tang, Ping W., 4,612,278, Cl. 430-381.000.
Morse, John E., 4,611,942, Cl. 402-79.000.
Parsons, Michael H.; and McGlen, James A., 4,611,800, Cl. 271-3.100.
Seely, Neil G., 4,611,895, Cl. 354-159.000.
Steklenski, David J.; and Keogh, Philip L., 4,612,279, Cl. 430-523.000.
Wilson, William C., 4,611,741, Cl. 227-99.000.
Eaton Corporation: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,612,465, Cl. 307-584.000.
Ebara Corporation: *See*—
Miyakawa, Shinpei; and Kinbara, Masaaki, 4,611,621, Cl. 137-115.000.
ebm Elektrobau Mulfingen GmbH & Co.: *See*—
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.
Eby, David H., to Tektronix, Inc. Programmable ripple counter having exclusive OR gates. 4,612,658, Cl. 377-52.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Method for establishing blood levels of biocide in animals. 4,612,186, Cl. 424-15.000.
Eckert, Guenter: *See*—
Bott, Kaspar; Penzel, Erich; and Eckert, Guenter, 4,612,392, Cl. 564-207.000.
Edagawa, Setsuji: *See*—
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, 4,611,810, Cl. 273-218.000.

Edeling, Martin; Freller, Helmut; Mund, Konrad; and Schack, Peter, to Siemens Aktiengesellschaft. Method for the fabrication of an implantable electrode. 4,612,100, Cl. 204-192.150.

Edelmann, Ludwig: *See*—
Brandenstein, Manfred; Edelmann, Ludwig; and Kaschube, Karl-Friedrich, 4,611,931, Cl. 384-477.000.

Edelson, Richard L. Method and system for externally treating the blood. 4,612,007, Cl. 604-5.000.

Edlund, Hans G. U.: *See*—
Pettersson, Rolf T.; Edlund, Hans G. U.; and Regebro, Bengt I. C., 4,611,540, Cl. 102-372.000.

Edmonds, David L.: *See*—
Dillon, Edward T.; and Edmonds, David L., 4,612,109, Cl. 208-131.000.

Edwards, Rick C.: *See*—
McCormick, Peter E.; Edwards, Rick C.; and Crawford, Keith R., 4,611,377, Cl. 29-407.000.

Edwards, William B., III, to Philip Morris Incorporated. Preparation of oxycarboxylic acids. 4,612,391, Cl. 562-577.000.

Efner, Howard F.: *See*—
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., 4,612,110, Cl. 208-251.00H.

Eguchi, Tamiyuki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Hollow fiber filter medium and process for preparing the same. 4,612,119, Cl. 210-500.230.

Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Polymer mixtures with a mat surface. 4,612,347, Cl. 525-73.000.

Eidsvoog, Frank H.; and Warren, Sean T., to Donaldson Company, Inc. Self-venting drain valve. 4,611,627, Cl. 137-588.000.

Eirich, H.: *See*—
Eirich, Willi, 4,611,922, Cl. 366-221.000.

Eirich, P.: *See*—
Eirich, Willi, 4,611,922, Cl. 366-221.000.

Eirich, W.: *See*—
Eirich, Willi, 4,611,922, Cl. 366-221.000.

Eirich, Willi, to Eirich, H.; Eirich, P.; and Eirich, W. Apparatus for treating materials which are capable of flow. 4,611,922, Cl. 366-221.000.

Eisai Co., Ltd.: *See*—
Homma, Naoshi; and Sato, Jin, 4,612,303, Cl. 514-23.000.

Eiszner, William H., Jr.: *See*—
Vanderlaan, Robert D.; and Eiszner, William H., Jr., 4,612,526, Cl. 335-229.000.

Electronic Systems Products Inc.: *See*—
Tucker, Arthur R., 4,612,582, Cl. 358-237.000.

Elfline, Geraldine S., to CX/Oxytech, Inc. Method for removing heavy metal from wastewater streams. 4,612,125, Cl. 210-724.000.

Eli Lilly and Company: *See*—
Grinnan, Edward L.; and Logsdon, Edward E., 4,612,367, Cl. 530-399.000.
Mynderse, Jon S.; and Bonjouklian, Rosanne, 4,612,330, Cl. 514-557.000.

Elkem a/s: *See*—
Bruff, William V. H.; and Olsen, Leif, 4,612,151, Cl. 264-105.000.

Ellenberger & Poensgen: *See*—
Peter, Josef, 4,612,528, Cl. 337-79.000.

Elliott, Cecil M.; and Redepenning, Jody G., to Research Corporation. Redox chromophore compounds and electrodes of metal containing substituted bipyridines. 4,611,890, Cl. 350-357.000.

Ellis, John C., Jr. Water degasification and distillation apparatus. 4,612,090, Cl. 202-176.000.

Ellis, Stafford M., to GEC Avionics Limited. Optical projectors for head up displays. 4,611,877, Cl. 350-174.000.

Elmore, Carl L.: *See*—
Sherman, Michael I.; and Elmore, Carl L., 4,612,286, Cl. 435-157.000.

Emerson, Peter J., to BCIRA. Ultrasonic testing. 4,611,495, Cl. 73-634.000.

Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., to AT&T Information Systems Inc. Integrated message service system. 4,612,416, Cl. 179-6.110.

Emhart Corporation: *See*—
Aiuola, Franco; and Nannini, Luciano, 4,611,455, Cl. 53-373.000.
Karcher, Ralph E., Jr., 4,612,538, Cl. 340-679.000.

Emhart Industries, Inc.: *See*—
Nebelung, Hermann H., 4,612,032, Cl. 65-165.000.

Emura, Noriaki: *See*—
Okuzono, Shuichi; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,612,343, Cl. 524-547.000.

Endo, Katsusuke: *See*—
Inagaki, Yoshio; and Endo, Katsusuke, 4,612,277, Cl. 430-233.000.

Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, to Kabushiki Kaisha Toshiba. Image signal reproduction circuit for swing image sensor. 4,612,581, Cl. 358-213.000.

Endoh, Hiroshi: *See*—
Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, 4,611,867, Cl. 339-14.00R.

Engel, Robert; Gobel, Adolph P., IV; Hammond, John E.; and Glatz, Alfred C., to General Foods Corporation. Method for making a low calorie dipeptide sweetening composition of alkaline pH. 4,612,202, Cl. 426-548.000.

English, George J.; and Rothwell, Harold L., Jr., to GTE Products Corporation. Single-ended metal halide discharge lamps and process of manufacture. 4,612,000, Cl. 445-6.000.

English, Larry W. Three-mold hand-over-hand blow molding machine. 4,611,981, Cl. 425-529.000.

Englund, Rolf A.: *See*—
Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., 4,611,976, Cl. 418-159.000.

Engstrom, Keith A.; and Frederiksen, Bjarne, to Illinois Tool Works Inc. Enclosure for electrical data input apparatus. 4,611,406, Cl. 33-443.000.

Enjoji, Susumu; and Ishiyama, Kazufumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing an ultrasonic transducer. 4,611,372, Cl. 29-25.350.

Ennis, Donald H.: *See*—
Boyer, Carl W.; and Ennis, Donald H., 4,612,181, Cl. 423-593.000.
Kim, Tai K.; Boyer, Carl W.; MacInnis, Martin B.; and Ennis, Donald H., 4,612,183, Cl. 423-593.000.

Enomoto, Tadayoshi: *See*—
Yasumoto, Masaaki; Hayama, Hiroshi; and Enomoto, Tadayoshi, 4,612,083, Cl. 156-633.000.

Enso-Gutzeit Oy: *See*—
Titoff, Juha, 4,612,115, Cl. 210-189.000.

Enstrom, Henrik S. Method primarily for performance control at heat pumps or refrigerating installations and arrangement for carrying out the method. 4,611,470, Cl. 62-127.000.

Enterline, Bettye J. Artificial Christmas trees. 4,612,218, Cl. 428-8.000.

Enviro-Spray Systems Incorporated: *See*—
Bittner, Norman, 4,611,457, Cl. 53-429.000.

EOA Systems, Inc.: *See*—
McCormick, Peter E.; Edwards, Rick C.; and Crawford, Keith R., 4,611,377, Cl. 29-407.000.

Epstein, Irving. Releaseable hook. 4,611,842, Cl. 294-82.330.

Erdman, Timothy R.: *See*—
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,612,132, Cl. 252-51.50A.

Erhardt, Harry G., to RCA Corporation. Time-division-multiplex clocking of multiple-charge-tunnel CCD structures, such as line-transfer CCD imagers. 4,612,579, Cl. 358-213.000.

Erni, Bruno: *See*—
Vuilleumier, Cyril; and Erni, Bruno, 4,611,925, Cl. 368-28.000.

Ernst Leitz Wetzlar GmbH: *See*—
Heitmann, Knut; Hoppe, Martin; Schneider, Eckhard; and Thaer, Andreas, 4,612,267, Cl. 430-3.000.
Muth, Karl-Heinz, 4,611,493, Cl. 73-606.000.

Esco Corporation: *See*—
Seifert, Dennis D., 4,611,766, Cl. 241-207.000.

Escrig, Ignacio L. Method of sewage treatment. 4,612,124, Cl. 210-721.000.

Essex Group, Inc.: *See*—
Peppler, Dennis L.; Zaman, Mohammad F.; Bornstein, Norman S.; and Hartz, Marvin E., 4,611,747, Cl. 228-125.000.

Estang, Bernard: *See*—
Brucker, Jean-Michel; and Estang, Bernard, 4,612,550, Cl. 343-756.000.

ETA SA Fabriques d'Ebauches: *See*—
Meister, Pierre-Andre ; and Koch, Daniel, 4,611,927, Cl. 368-188.000.

Ethicon, Inc.: *See*—
Liland, Alfred; and Regula, Donald W., 4,612,230, Cl. 428-167.000.

Ethyl Corporation: *See*—
Lee, John Y., 4,612,398, Cl. 568-73.000.

Eustacchio, Peter; Perchthaler, Heinz; and Syrowatka, Rupert, to Maschinenfabrik Andritz Actiengesellschaft. Regulating apparatus for dewatering machines. 4,612,123, Cl. 210-709.000.

Evans, Vernon C.: *See*—
Gill, Ronald P.; and Evans, Vernon C., 4,612,595, Cl. 361-93.000.

Evans, William P., to United States of America, Air Force. Harmonic distortion reduction technique for data acquistion. 4,612,533, Cl. 340-347.0CC.

Everett, Lynn E., to Tusco Manufacturing Company. Telescoping display canopy. 4,611,866, Cl. 312-257.00R.

Everett, Richard C. Bicycle brake assembly. 4,611,692, Cl. 188-73.100.

Ewing, Ronald J.: *See*—
La Barge, Robert L.; and Ewing, Ronald J., 4,611,381, Cl. 29-432.000.

Exxon Production Research Co.: *See*—
Curran, John W., 4,611,685, Cl. 181-102.000.

Exxon Research and Engineering Co.: *See*—
Bock, Jan; Downs, Hartley H.; Siano, Donald B.; and Pace, Salvatore J., 4,612,332, Cl. 521-65.000.
Stein, Alexander, 4,611,930, Cl. 374-126.000.

Eyedex Associates: *See*—
Schrier, Melvin, 4,611,893, Cl. 351-239.000.

Eylon, Daniel: *See*—
Levin, Lev; Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,612,066, Cl. 148-20.300.

F.W. Oventrop Arn. Aohn KG: *See*—
Seiffert, Gunther, 4,611,629, Cl. 137-614.210.

Fabian, Werner; Roehle, Helmut; and Wolfram, Peter, to Heinrich-Hertz-Institute fur Nachrichtentechnik Berlin GmbH. Method of removing noxious substances from gases. 4,612,174, Cl. 423-210.000.

Facet Enterprises, Inc.: *See*—
Giometti, Paul F., 4,611,499, Cl. 74-6.000.

FAG Kugelfischer Georg Schafter (KGaA): *See*—
Hofmann, Heinrich; and Ulsenheimer, Horst, 4,611,933, Cl. 384-512.000.

Fairchild Camera & Instrument Corporation: *See*—
Dyck, Rudolph H., 4,612,522, Cl. 333-165.000.

Fairwood, Raymond S.; and Weal, Bryan J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State in Her Britannic Majesty's Government of the. Battery initiator system. 4,612,264, Cl. 429-114.000.

Falb, Wolfgang: *See*—
Ryschka, Martin; Falb, Wolfgang; Buttner, Peter; and Wallroth, Carl-Friedrich, 4,611,590, Cl. 128-203.140.

Faletra, Salvatore: *See*—
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.

Falk, Robert A.; and Phillis, Gary L., to Ball Corporation. Method and apparatus for optically measuring distance and velocity. 4,611,912, Cl. 356-5.000.

Falk, Robert A., to Ciba-Geigy Corporation. Homo- and co- (addition) polymers of di-perfluoroalkyl carbamyl group containing (meth) acrylate monomers. 4,612,356, Cl. 526-243.000.

Familian Corp.: *See*—
Gittleman, Morris, 4,611,835, Cl. 285-155.000.

Farley, James R.: *See*—
Maier, Alfred E.; Farley, James R.; and Tomasic, Nicholas A., 4,612,426, Cl. 200-144.00R.

Farnsworth, Robert P.; and Nesler, John J., to Hughes Aircraft Company. Power supply circuit utilizing transformer winding voltage integration for indirect primary current sensing. 4,612,610, Cl. 363-26.000.

Fasciati, Alfred, to Ciba-Geigy Corporation. Disazo 4,4'-diaminostilbene-2,2'-disulfonic acids dye. 4,612,369, Cl. 534-689.000.

Faudree, Thomas L.: *See*—
Obie, John P.; and Faudree, Thomas L., 4,611,612, Cl. 134-65.000.

Faurote, Dolph, Jr.; and Faurote, Dolph, III. Paint removing cleaning compositions. 4,612,141, Cl. 252-546.000.

Faurote, Dolph, III: *See*—
Faurote, Dolph, Jr.; and Faurote, Dolph, III, 4,612,141, Cl. 252-546.000.

Fay, James R.: *See*—
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.

Federal Paper Board Co., Inc.: *See*—
Sutherland, Robert L., 4,611,754, Cl. 229-40.000.

Feiber, Wolfgang E. A.; Keahey, Sammie G.; and Kunkle, James R., to AMP Incorporated. Gripper head. 4,611,846, Cl. 294-88.000.

Feitler, David, to Air Products and Chemicals, Inc. Production of carboxylic acids and esters. 4,612,387, Cl. 560-232.000.

Felix, Franz, to Ciba-Geigy Corporation. Use of metal complexes of hydrazones as pigments. 4,612,014, Cl. 8-452.000.

Ferguson, Donald C.: *See*—
Smith, Merrill M.; and Ferguson, Donald C., 4,612,074, Cl. 156-85.000.

Ferguson, James S.; Jackson, J. Eric; and Brower-Berkhoven, Isaac B. Snorkel mast for a semi-submersible vehicle. 4,611,551, Cl. 114-339.000.

Ferranti plc: *See*—
Brown, Kenneth R.; and Watson, Norman F., 4,611,491, Cl. 73-517.00B.

Ferri, John L.: *See*—
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.

Ferris, Carlisle K. Camouflaged vehicle such as an aircraft, surface vessel or the like. 4,611,524, Cl. 89-36.010.

Figler, Alan A.; and Selman, John J., to Baxter Travenol Laboratories, Inc. Fail-safe apparatus and method for reading switches. 4,612,639, Cl. 371-25.000.

Filer, Paul G. Bleacher back-rest. 4,611,852, Cl. 297-352.000.

Finetex, Inc.: *See*—
Novakovic, Mario; and Abend, Phillip G., 4,612,136, Cl. 252-134.000.

Finn, James C., III: *See*—
Fogarty, Thomas J.; Finn, James C., III; Kinney, Thomas B.; and Hermann, George D., 4,611,593, Cl. 128-325.000.

Finney, Roy P., to Medical Engineering Corp. Expandable penile implant. 4,611,584, Cl. 128-79.000.

Finnigan MAT GmbH: *See*—
Brunnee, Curt; Dobberstein, Peter; and Kappus, Gunter, 4,612,440, Cl. 250-281.000.

Finsliparna AB: *See*—
Siden, Jan, 4,611,438, Cl. 51-206.00R.

Fiquet, Claire: *See*—
Zorayan, Vahan; and Fiquet, Claire, 4,612,188, Cl. 424-47.000.

Fischer, Herbert; and Kriebel, Manfred, to Metallgesellschaft Aktiengesellschaft. Method of degasifying liquid sulfur which contains hydrogen sulfide. 4,612,020, Cl. 55-40.000.

Fischer, Manfred: *See*—
Neuhauser, Hans J.; Buran, Ulrich; and Fischer, Manfred, 4,612,256, Cl. 428-547.000.

Fitzpatrick, James P.: *See*—
Asendorf, Robert H.; Fitzpatrick, James P.; and Graves, Burton W., 4,612,545, Cl. 343-18.00E.

Fleissner, Gerold, to Vepa Aktiengesellschaft. Apparatus for the continuous washing of lengths of textile material. 4,611,476, Cl. 68-158.000.

Flemming, John P. W., to AT&T Technologies, Inc. Method and apparatus for picking up a batch of articles. 4,611,845, Cl. 294-87.100.

Fleury, Kerry G.: *See*—
Ianitelli, Pingree; and Fleury, Kerry G., 4,612,434, Cl. 219-273.000.

Fluck, Rene , to SIG Schweizerische Industrie-Gesellschaft. Apparatus for separating article groups of predetermined length from a continuously advanced article stack. 4,611,705, Cl. 198-425.000.

Fogarty, Thomas J.; Finn, James C., III; Kinney, Thomas B.; and Hermann, George D., to Fogarty, Thomas J. Vessel occluding instrument. 4,611,593, Cl. 128-325.000.

Fogra Deutesche Forschungsgesellschaft fur Druck-und Reproduktionstechnik e.v.: *See*—
Stockhausen, Norbert, 4,611,486, Cl. 73-64.400.

Folkins, Jeffrey J., to Xerox Corporation. Apparatus for sensing the presence of toner particles. 4,611,900, Cl. 355-3.0DD.

Forberg, Horst: *See*—
Gerke, Dieter; Forberg, Horst; and Radelow, Wolfgang, 4,611,874, Cl. 339-97.00R.

Ford Aerospace & Communications Corporation: *See*—
Wisniewski, Jacob H., 4,612,507, Cl. 328-169.000.

Ford Motor Company: *See*—
Cotter, Patrick J., 4,611,770, Cl. 242-107.40D.

Forgo, Imre; Huwyler, Rene ; and Francois, Jacques, to Ciba-Geigy Corporation. Process for the preparation of heat-curable adhesive films. 4,612,209, Cl. 427-54.100.

Forrest, Stephen R.; Kaplan, Martin L.; and Schmidt, Paul H., to AT&T Bell Laboratories. Devices formed utilizing organic materials. 4,611,385, Cl. 29-574.000.

Forschungsgesellschaft fur Biomedizinischs Technik E.V. Goethestrasse: *See*—
Heimes, Horst P., 4,611,578, Cl. 128-1.00D.

Fort, Pierre; and Pierrel, Michel, to Pont-a-Mousson S.A. Socket core support device for centrifugal pipe casting machine. 4,611,650, Cl. 164-298.000.

Fory, Werner: *See*—
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,612,037, Cl. 71-92.000.

Foster, Raymond K. Reciprocating channel floor conveyor. 4,611,708, Cl. 198-750.000.

Foster, Richard A.: *See*—
Griebel, Arthur H., III; and Foster, Richard A., 4,612,649, Cl. 373-45.000.

Foster Wheeler Energy Corporation: *See*—
Russomano, Richard J., 4,611,950, Cl. 405-128.000.

Fournier, Paul J. E.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Frangible fittings. 4,611,618, Cl. 137-68.100.

Fox, Charles L., Jr.; and Modak, Shanta M., to Columbia University in the City of New York, The Trustees of. Method for preparing infection-resistant materials. 4,612,337, Cl. 523-113.000.

Fox, Timothy R., to Kabushiki Kaisha Toshiba. Circuit for stabilizing electromagnet coil current of a magnetic resonance imaging device. 4,612,596, Cl. 361-146.000.

Francois, Jacques: *See*—
Forgo, Imre; Huwyler, Rene ; and Francois, Jacques, 4,612,209, Cl. 427-54.100.

Frandsen, Jorgen, to Burroughs Corporation. Dual coil/dual magnet actuator. 4,612,592, Cl. 360-106.000.

Frank, Dorothy M.: *See*—
Reynolds, Martin L.; Frank, Dorothy M.; Riehl, Tilford F.; and McMurtrie, Andrew, 4,611,607, Cl. 131-336.000.

Frank, Lawrence. Cat scratching post and door hanging assembly. 4,611,556, Cl. 119-29.000.

Franke, Albrecht; Gries, Josef; Mueller, Claus D.; and Lenke, Dieter, to BASF Aktiengesellschaft. Aminopropanol derivatives of 1-(2-hydroxyphenyl)-3-phenylpropanols and therapeutic agents containing these compounds. 4,612,320, Cl. 514-317.000.

Franke, Karl: *See*—
Gosch, Hans-Werner; Franke, Karl; Kohlbecker, Jorg; and Dormichian, Bahram, 4,612,173, Cl. 423-170.000.

Frankenburg, Peter E., to Du Pont de Nemours, E. I., and Company. Hydraulically entangled PTFE/glass filter felt. 4,612,237, Cl. 428-219.000.

Franklin, Irving H.; and Gluck, Kurt M., to Franklin Sports Industries, Inc. Exercise device. 4,611,805, Cl. 272-136.000.

Franklin Sports Industries, Inc.: *See*—
Franklin, Irving H.; and Gluck, Kurt M., 4,611,805, Cl. 272-136.000.

Franz, Peter; and Ross, Werner, to Robert Bosch GmbH. Commutator ring manufacturing method and apparatus. 4,611,391, Cl. 29-597.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,611,541, Cl. 104-2.000.

Fraser, Michael J.; and Legros, Raymond D., to Refurbished Turbine Components Ltd. Turbine blade repair. 4,611,744, Cl. 228-119.000.

Fredenucci, Pierre; and Berhaut, Jean-Bernard, to Arjomari-Prioux. Paper sheet having a very high proportion of latex, process for preparing same and applications thereof particularly as a substitution product for impregnated glass webs. 4,612,251, Cl. 428-511.000.

Frederiksen, Bjarne: *See*—
Engstrom, Keith A.; and Frederiksen, Bjarne, 4,611,406, Cl. 33-443.000.

Freller, Helmut: *See*—
Edeling, Martin; Freller, Helmut; Mund, Konrad; and Schack, Peter, 4,612,100, Cl. 204-192.150.

French Systems, Inc.: *See*—
Hindman, David B; and Lima, Joseph D., 4,612,116, Cl. 210-333.100.

Friedmann, Oswald, to LuK Lamellen und Kupplungsbau GmbH. Torsion damping assembly for use in motor vehicles. 4,611,701, Cl. 192-110.00B.

Fritschi, Edgar: *See*—
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Oswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.

Fritz, John X.: *See*—
Packer, Marvin; and Fritz, John X., 4,612,249, Cl. 428-424.800.

Froes, Francis H.: *See*—
Levin, Lev; Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,612,066, Cl. 148-20.300.

Frohlich, Peter; and Herb, Armin, to Hilti Aktiengesellschaft. Expansion dowel with an expansion wedge and an annular expansion member. 4,611,963, Cl. 411-54.000.

Froud, Roderick W.: *See*—
Holmes, John P.; and Froud, Roderick W., 4,612,104, Cl. 204-272.000.

Fuji Electric Company Ltd.: *See*—
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.

Fuji Electric Corporate Research and Development Ltd.: *See*—
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.

Fuji Kagakushi Kogyo Co., Ltd.: *See*—
Shimazaki, Yoshikazu; Shimizu, Suekichi; and Nakajima, Nobuyuki, 4,612,243, Cl. 428-321.300.

Fuji Photo Film Co., Ltd.: *See*—
Inagaki, Yoshio; and Endo, Katsusuke, 4,612,277, Cl. 430-233.000.
Inatsuki, Kenichi, 4,611,907, Cl. 355-41.000.
Iwata, Isamu; Hosoe, Hirotaro; and Matsuoka, Yuji, 4,611,553, Cl. 118-50.000.
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,612,271, Cl. 430-72.000.
Minami, Akira; Nakao, Sho; and Nakayama, Takao, 4,611,409, Cl. 34-9.000.
Oishi, Kengo, 4,612,593, Cl. 360-130.310.
Okamura, Hisashi; and Kawamoto, Hiroshi, 4,612,280, Cl. 430-621.000.
Taniguchi, Yutaka, 4,612,144, Cl. 264-1.500.
Ushimaru, Akira; Fujiyama, Masaaki; Okutu, Toshimitu; and Miyoshi, Takahito, 4,612,235, Cl. 428-216.000.
Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,612,290, Cl. 436-97.000.

Fujii, Shizuka: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.

Fujikawa, Yoshihiro, to Toyota Jidosha Kabushiki Kaisha. Clip device for fixing window glass in motor vehicle. 4,611,850, Cl. 296-201.000.

Fujimoto, Masaharu: *See*—
Sasaki, Isao; Mori, Hiroshi; and Fujimoto, Masaharu, 4,612,363, Cl. 528-274.000.

Fujinami, Hiroshi: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.

Fujino, Yoshihiro; and Kurahashi, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Method for manufacturing an eyeglass-frame. 4,611,371, Cl. 29-20.000.

Fujinuma, Makoto: *See*—
Suzuki, Fumio; Fujinuma, Makoto; Ohtake, Yasuhisa; and Inaba, Michihiko, 4,612,061, Cl. 148-6.350.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, 4,612,376, Cl. 544-317.000.

Fujita, Hiroshi: *See*—
Mori, Hirotaro; and Fujita, Hiroshi, 4,612,059, Cl. 148-4.000.

Fujitsu Limited: *See*—
Goto, Hiroshi, 4,611,386, Cl. 29-576.00W.
Shigaki, Masafumi; and Takeda, Yukio, 4,612,514, Cl. 330-277.000.

Fujiwara, Shinsuke, to NEC Home Electronics Ltd. Sheet feeding device for an impact-type printer. 4,611,939, Cl. 400-637.000.

Fujiyama, Masaaki: *See*—
Ushimaru, Akira; Fujiyama, Masaaki; Okutu, Toshimitu; and Miyoshi, Takahito, 4,612,235, Cl. 428-216.000.

Fukada, Nobuo: *See*—
Koizumi, Masaaki; Fukada, Nobuo; and Okano, Hiroyuki, 4,612,040, Cl. 75-10.650.

Fukami, Takeshi: *See*—
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, 4,612,627, Cl. 364-736.000.

Fukui, Hiroshi: *See*—
Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, 4,612,561, Cl. 357-38.000.

Fukunaga Takao, to Kabushiki Kaisha Daikin Seisakusho. Control valve for a hydraulic clutch. 4,611,699, Cl. 192-0.076.

Fukushi, Kazue, to SS Pharmaceutical Co., Ltd. Antitumor formulation containing lipopolysaccharide with trehalose derivatives. 4,612,304, Cl. 514-53.000.

Fukushi, Yukihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus with reduced image forming time. 4,611,903, Cl. 355-14.00R.

Fulcher, Robert A.: *See*—
Beavers, Allan E.; and Fulcher, Robert A., 4,611,446, Cl. 52-163.000.

Fulkerson, William C.: *See*—
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.

Furman, Lynn C.: *See*—
Blair, Kelvin R.; Furman, Lynn C.; and Knott, David M., 4,611,389, Cl. 29-589.000.

Furukawa Electric Co., Ltd., The: *See*—
Tanaka, Yasuzo; and Furuto, Yoshio, 4,611,390, Cl. 29-599.000.

Furukawa, Heizaburo: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Furukawa, Noboru: *See*—
Tsuboi, Norio; Furukawa, Noboru; and Miyazawa, Sadayuki, 4,612,018, Cl. 55-15.000.

Furukawa, Yasuo: *See*—
Shimizu, Toshihide; Furukawa, Yasuo; and Kaneko, Ichiro, 4,612,354, Cl. 526-62.000.

Furuta, Yoshiteru; and Nomura, Yasushi, to Hitachi, Ltd. Method for analyzing liquid sample. 4,612,289, Cl. 436-34.000.

Furuto, Yoshio: *See*—
Tanaka, Yasuzo; and Furuto, Yoshio, 4,611,390, Cl. 29-599.000.

G.D. Societa Per Azioni: *See*—
Neri, Armando, 4,612,445, Cl. 250-551.000.

Gaitskell, John N., to Imperial Chemical Industries PLC. Polyamide articles resistant to hot antifreeze compositions. 4,612,222, Cl. 428-35.000.

Galanto, Charles; and Lundy, Charles R. Convertible patches for apparel. 4,611,355, Cl. 2-246.000.

Gallis, Anthony J., to Harsco Corporation. Safety lock for jump scaffolding. 4,611,784, Cl. 249-20.000.

Galloway, Roy C.: *See*—
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,612,266, Cl. 429-221.000.

Gallusser, David O.: *See*—
Punako, Stephen; and Gallusser, David O., 4,611,873, Cl. 339-94.00M.

Gametime, Inc.: *See*—
Graham, Robert G., Jr., 4,611,439, Cl. 52-9.000.

Gans, Michael J.; Schneider, Martin V.; and Trambarulo, Ralph F., to AT&T Bell Laboratories. QPSK modulator or demodulator using subharmonic pump carrier signals. 4,612,518, Cl. 332-21.000.

Gargini, Eric J.; and Kalanit, Gideon, to Communications Patents Limited. Switch assembly and circuit. 4,612,519, Cl. 333-103.000.

Gavronsky, German; and Wologodzew, Leo, to Pitney Bowes Inc. Tape feeding apparatus for mailing machine. 4,611,736, Cl. 226-134.000.

Gaz de France: *See*—
Bertocchio, Rene; Genest, Bernard; and Mathais, Henri, 4,612,133, Cl. 252-68.000.

Gebelius, Sven R. V. Flexible joint. 4,611,946, Cl. 403-102.000.

Geberth, John D., Jr. Reversible spray tip. 4,611,758, Cl. 239-119.000.

Gebr. Bode & Co. GmbH: *See*—
Britzke, Ingo; and Kramer, Hans, 4,611,434, Cl. 49-257.000.

GEC Avionics Limited: *See*—
Ellis, Stafford M., 4,611,877, Cl. 350-174.000.

Geke, Juergen; and Meyer, Dieter, to Henkel Kommanditgesellschaft auf Aktien. Compositions for removing polymeric films. 4,612,058, Cl. 134-38.000.

Gellert, Jobst U. Method of manufacture of an injection molding integral heated probe. 4,611,394, Cl. 29-611.000.

Gemtron Corporation: *See*—
Hutson, Frederick O., 4,611,717, Cl. 211-34.000.

Genba, Tsuneo; Mizobe, Akio; Okazaki, Masaki; and Sakuragi, Isao, to Kuraray Company, Limited. Method for production of high-tenacity, fine-denier polyvinyl alcohol fiber. 4,612,157, Cl. 264-185.000.

General Dynamics Corporation: *See*—
Henderson, J. Kirston, 4,612,670, Cl. 455-607.000.

General Electric Company: *See*—
Beamon, William S., III; and Tegge, Edward H., Jr., 4,612,482, Cl. 315-371.000.
Breithaupt, David, 4,612,578, Cl. 358-212.000.
Downing, Robert D., 4,612,475, Cl. 313-640.000.
Geyer, Bernard H., Jr.; and Perkins, Donald W., 4,612,549, Cl. 343-379.000.
Pelc, Norbert J., 4,612,504, Cl. 324-309.000.
Peters, Edward N., 4,612,361, Cl. 528-185.000.

General Feeds, Inc.: *See*—
Durhman, Neil E., 4,611,642, Cl. 141-114.000.

General Foods Corporation: *See*—
Engel, Robert; Gobel, Adolph P., IV; Hammond, John E.; and Glatz, Alfred C., 4,612,202, Cl. 426-548.000.

General Foods Inc.: *See*—
Huffman, Connie K. A., 4,612,204, Cl. 426-590.000.

General Kinematics: *See*—
Kraus, Richard B.; and Musschoot, Albert, 4,611,709, Cl. 198-764.000.
Musschoot, Albert, 4,611,469, Cl. 62-100.000.

General Motors Corporation: *See*—
Costello, Scott M.; and Vukovich, William J., 4,612,501, Cl. 324-208.000.

Hamren, Glen C., 4,612,597, Cl. 361-152.000.
Muzechuk, Richard A., 4,611,795, Cl. 267-140.100.
Partin, Dale L., 4,612,644, Cl. 372-44.000.
Warner, Hermann, 4,611,435, Cl. 49-374.000.

General Signal Corp.: *See*—
Petit, William A., 4,611,775, Cl. 246-28.00F.

General Systems Research, Ltd.: *See*—
Schmidt, Erick; Grenier, Leonard E.; and Pallagi, Steven, 4,611,881, Cl. 350-6.900.

Genest, Bernard: *See*—
Bertocchio, Rene; Genest, Bernard; and Mathais, Henri, 4,612,133, Cl. 252-68.000.

George, Dieno: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.

George, Harvey F.; and Toor, Yair, to Gravure Research Institute, Inc. Screen gravure engraving system for electromechanical engravers. 4,612,584, Cl. 358-299.000.

Georgia-Pacific Corporation: *See*—
Lindell, Courtney D., 4,612,017, Cl. 44-10.00B.

Gerber Products Company: *See*—
Lauro, Charles W., 4,611,431, Cl. 49-55.000.

Gergely, John S., to Conoco Inc. Apparatus and method for generating light having a wavelength in the range of approximately 250–550 nanometers. 4,612,456, Cl. 307-425.000.

Gerke, Dieter; Forberg, Horst; and Radelow, Wolfgang, to Krone GmbH. Device for making LSA-PLUS contact with conductor wires of different types and sizes. 4,611,874, Cl. 339-97.00R.

German, Randall M.; Lall, Chaman; and Madan, Deepak S., to Du Pont de Nemours, E. I., and Company. Dimensionally stable powder metal compositions. 4,612,048, Cl. 75-246.000.

Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., to Data General Corporation. Digital data bus system for connecting a controller and disk drives. 4,612,613, Cl. 364-200.000.

Gerstenmaier, William J.; and Bisker, Richard G., to Dresser Industries, Inc. Universal nozzle boot for fuel dispenser. 4,611,729, Cl. 222-75.000.

Geschwender, Robert C., to Peterson, George W., a part interest. Front-wheel drive motor vehicle. 4,611,684, Cl. 180-223.000.

Gesing, Adam J.: *See*—
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.

Gettelfinger, Irvin. Golf putting practice apparatus. 4,611,809, Cl. 273-176.00H.

Getty Oil Company: *See*—
DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., 4,611,659, Cl. 166-274.000.

Geyer, Bernard H., Jr.; and Perkins, Donald W., to General Electric Company. Interference canceller loop having automatic nulling of the loop phase shift for use in a reception system. 4,612,549, Cl. 343-379.000.

Gibbons, James F.: *See*—
Moddel, Garret R.; Christel, Lee A.; and Gibbons, James F., 4,612,408, Cl. 136-244.000.

Gibbons, John P.; and Powell, Rex B., to United States of America, Army. Fiber optic track/reaim system. 4,611,771, Cl. 244-3.120.

Gibson, James B., to Chevron Research Company. Method and device for platform encrustation eradication. 4,612,056, Cl. 134-6.000.

Gilbert, Edna M.: *See*—
Tengs, Anthony M.; and Gilbert, Edna M., 4,612,219, Cl. 428-8.000.

Giles, Clinton R., to Northern Telecom Limited. Laser transmitter. 4,612,671, Cl. 455-609.000.

Gill, Ronald P.; and Evans, Vernon C., to Peabody Coal Company. DC power control system. 4,612,595, Cl. 361-93.000.

Gillard, Calvin W.; Buholz, Neal E.; and Wells, William M., III, to United States of America, Air Force. Absolute distance sensor. 4,611,915, Cl. 356-349.000.

Gillio-tos, Mario; Vassarotti, Enzo; Schirmer, Henry G.; and von Bismarck, Gottfried, to W. R. Grace & Co., Cryovac Div. Process for making a vacuum skin package and product formed thereby. 4,611,456, Cl. 53-427.000.

Gilmore, Paul T.: *See*—
Bekiarian, Paul G.; and Gilmore, Paul T., 4,612,357, Cl. 526-247.000.

Gilz, Gunter; and Henning, Manfred, to Bosch und Pierburg System Ohg. Method of setting a reference value, for example to zero-set a signal source, particularly a transducer. 4,612,450, Cl. 307-264.000.

Ginter, James W.; Thorpe, Donald H.; and Cooke, Victor F. G., to Occidental Chemical Corporation. Aromatic carboxylic acid and metal-modified phenolic resins and methods of preparation. 4,612,254, Cl. 428-531.000.

Giometti, Paul F., to Facet Enterprises, Inc. Engine starter gearing. 4,611,499, Cl. 74-6.000.

Girlock Limited: *See*—
Wang, Nui, 4,611,693, Cl. 188-73.340.

Giroud-Abel, Bruno, to Rhone-Poulenc Specialites Chimiques. Heat stabilized polyamide compositions. 4,612,339, Cl. 524-84.000.

Gittleman, Morris, to Familian Corp. Pipe coupling. 4,611,835, Cl. 285-155.000.

Gittos, Maurice W.: *See*—
Hibert, Marcel; and Gittos, Maurice W., 4,612,312, Cl. 514-225.000.

GKN Automotive Components: *See*—
Hazebrook, Daniel W., 4,611,373, Cl. 29-148.40C.

GKN Automotive Components Inc.: *See*—
Krude, Werner; and Hazebrook, Daniel W., 4,611,681, Cl. 180-73.400.

Glasford, Charles H. Luggage attachment for wheelchair. 4,611,819, Cl. 280-289.0WC.

Glatz, Alfred C.: *See*—
Engel, Robert; Gobel, Adolph P., IV; Hammond, John E.; and Glatz, Alfred C., 4,612,202, Cl. 426-548.000.

Gloaguen, Gilbert Y. M.; and Moussie, Michel, to U.S. Philips Corporation. Circuit for translating signal levels between a logic of the saturated type and a logic of the non-saturated type. 4,612,460, Cl. 307-475.000.

Glover, Douglas W.; Hoffer, John C.; Johnson, Erlon F.; and Schaffer, Ronald R., to AMP Incorporated. Fiber optic connector assembly and wall outlet thereof. 4,611,887, Cl. 350-96.210.

Glover, Henry. Artist's sketching device. 4,611,994, Cl. 434-85.000.

Gluck, Kurt M.: *See*—
Franklin, Irving H.; and Gluck, Kurt M., 4,611,805, Cl. 272-136.000.

Gobel, Adolph P., IV: *See*—
Engel, Robert; Gobel, Adolph P., IV; Hammond, John E.; and Glatz, Alfred C., 4,612,202, Cl. 426-548.000.

Goddard, Donald G.: *See*—
Vasseghi, Nader; and Goddard, Donald G., 4,612,458, Cl. 307-446.000.

Goetze AG: *See*—
Neuhauser, Hans J.; Buran, Ulrich; and Fischer, Manfred, 4,612,256, Cl. 428-547.000.

Goldberg, Newton N.; and Merian, Jacques S., to Westinghouse Electric Corp. Lubricated polyester enameled electrical conductors. 4,612,246, Cl. 428-379.000.

Goldhammer, Mark I.; and Sigalla, Armand, to Boeing Company, The. Tapered thickness-chord ratio wing. 4,611,773, Cl. 244-35.00R.

Goldstein, Henry; Cronan, Charles L.; and Chicoye, Etzer, to Miller Brewing Company. Preparation of low alcohol beverages by reverse osmosis. 4,612,196, Cl. 426-14.000.

Gonda, Michihiro: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.

Gonzalez, Jeffrey M.: *See*—
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.

Goodrich, Roy G., to Louisiana State University and Mechanical College. Liquid level indicator and valve. 4,611,623, Cl. 137-210.000.

Gordon, Harry W.; and Chung, Kenneth, to Del Laboratories, Inc. Sty ointment and method of using the same. 4,612,193, Cl. 424-146.000.

Gordon, Roy G. Coating process for making non-iridescent glass structure. 4,612,217, Cl. 427-255.100.

Goris, Gregg A.; and Pettit, John, to Vetco Offshore Industries, Inc. Casing hanger and running apparatus. 4,611,663, Cl. 166-382.000.

Gornall, Graham J., to Lucas Industries Public Limited Company. Hydraulic actuator assemblies for vehicle brakes. 4,611,691, Cl. 188-71.800.

Gosch, Hans-Werner; Franke, Karl; Kohlbecker, Jorg; and Dormichian, Bahram, to Krupp Koppers GmbH. Method of purifying by-product gypsum. 4,612,173, Cl. 423-170.000.

Gosselin, Charles E.: *See*—
May, James D.; and Gosselin, Charles E., 4,612,622, Cl. 364-560.000.

Goto, Hiroshi, to Fujitsu Limited. Method of producing a semiconductor device. 4,611,386, Cl. 29-576.00W.

Goto, Kunihisa: *See*—
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, 4,612,394, Cl. 564-420.000.

Gotou, Toshirou: *See*—
Obara, Takeshi; Gotou, Toshirou; and Kobayashi, Kazuyuki, 4,612,232, Cl. 428-172.000.

Gourmel, Yves; Pierrel, Michel; and Bellocci, Rio, to Pont-A-Mousson S.A. Method and apparatus for continuous casting of metal pipe with integral end fitting. 4,611,651, Cl. 164-464.000.

Graff, James C. Solid oral dosage dispenser with safety, tamper-proof and sanitation features. 4,611,727, Cl. 221-154.000.

Graffam, Don E.; Lezon, Lawrence L.; and Slaters, Arthur R., Jr., to Signode Corporation. Structural panel. 4,612,225, Cl. 428-116.000.

Graham, Robert G., Jr., to Steadfast, Inc.; and Gametime, Inc. Portable bleacher. 4,611,439, Cl. 52-9.000.

Grallert, Hans-Joachim; and Starck, Alexander, to Siemens Aktiengesellschaft. Method for clock rate conversion. 4,612,573, Cl. 358-140.000.

Grandona, Adriano: *See*—
Vittone, Andrea; Camprincoli, Pierpaolo; and Grandona, Adriano, 4,612,229, Cl. 428-155.000.

Graves, Burton W.: *See*—
Asendorf, Robert H.; Fitzpatrick, James P.; and Graves, Burton W., 4,612,545, Cl. 343-18.00E.

Gravure Research Institute, Inc.: *See*—
George, Harvey F.; and Toor, Yair, 4,612,584, Cl. 358-299.000.

Gray, Ronald D.; and Orehoski, Michael A., to Pennsylvania Engineering Corporation. Steel making method. 4,612,043, Cl. 75-49.000.

Grayhack, John T.; and Benderev, Theodore V., to Northwestern University. Medical instrument for containment and removal of calculi. 4,611,594, Cl. 128-328.000.

Great Lakes Carbon Corporation: *See*—
Joo , Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,611,396, Cl. 29-623.500.
Green, Vernon L.: *See*—
Osterhoudt, M. Glenn, III; and Green, Vernon L., 4,611,664, Cl. 166-902.000.
Greenhouse, Robert: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,612,325, Cl. 514-413.000.
Gregor, Lawrence V., to International Business Machines Corporation. Multilayer resists with improved sensitivity and reduced proximity effect. 4,612,275, Cl. 430-296.000.
Gregory, Ted W., to Arens Controls, Inc. Throttle control assembly. 4,611,502, Cl. 74-502.000.
Grenier, Leonard E.: *See*—
Schmidt, Erick; Grenier, Leonard E.; and Pallagi, Steven, 4,611,881, Cl. 350-6.900.
Greuter, Hans: *See*—
Bosshard, Hans; and Greuter, Hans, 4,612,378, Cl. 548-170.000.
Grevstad, Paul E. Process for adding electrolyte to a fuel cell stack. 4,612,262, Cl. 429-14.000.
Griebel, Arthur H., III; and Foster, Richard A., to Cabot Corporation. Process for refining metal. 4,612,649, Cl. 373-45.000.
Gries, Josef: *See*—
Franke, Albrecht; Gries, Josef; Mueller, Claus D.; and Lenke, Dieter, 4,612,320, Cl. 514-317.000.
Grinnan, Edward L.; and Logsdon, Edward E., to Eli Lilly and Company. Process for purifying growth hormone-like materials. 4,612,367, Cl. 530-399.000.
Grone, Siegfried: *See*—
Luckow, Herbert; Plantikow, Ulrich; and Grone, Siegfried, 4,611,751, Cl. 228-184.000.
Groothius, Paul B., to Clark Equipment Company. Hydraulically actuated planetary wheel drive. 4,611,506, Cl. 74-794.000.
Groothoff, Adriaan J., to U.S. Philips Corporation. Deflection coil system for a picture display tube. 4,612,524, Cl. 335-210.000.
Grosse-Brinkhaus, Karl H.: *See*—
Degner, Dieter; Steckhan, Eberhard; and Grosse-Brinkhaus, Karl H., 4,612,092, Cl. 204-59.00R.
Grover, Wayne D.; and Lefebvre, Martin C., to Northern Telecom Limited. Multiple channel depacketizer. 4,612,636, Cl. 370-94.000.
Grubner, Kurt. Windshield wiper for land, sea and marine vehicles, in particular for trucks (lorries) and passenger automobiles. 4,611,364, Cl. 15-250.220.
Grumann Aerospace Corporation: *See*—
Aleck, Benjamin J., 4,611,837, Cl. 285-305.000.
Grumman Aerospace Corporation: *See*—
Caserta, Anthony L.; Squires, Russell W.; and Szuchy, Nicholas C., 4,611,378, Cl. 29-407.000.
Gruppo Lepetit S.p.A.: *See*—
Winters, Giorgio, 4,612,318, Cl. 514-293.000.
GTE Communication Systems Corp.: *See*—
Smith, Louis W., 4,612,419, Cl. 179-90.00D.
GTE Laboratories Incorporated: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,611,384, Cl. 29-571.000.
Liu, Jia-Ming; and Chen, Ying-Chih, 4,612,645, Cl. 372-45.000.
GTE Products Corporation: *See*—
Boyer, Carl W.; and Ennis, Donald H., 4,612,181, Cl. 423-593.000.
Brunelli, Timothy A.; and Cheresnowsky, Michael J., 4,612,172, Cl. 423-56.000.
Eames, Robert J.; and Johnson, Richard E., 4,611,398, Cl. 29-841.000.
English, George J.; and Rothwell, Harold L., Jr., 4,612,000, Cl. 445-6.000.
Kim, Tai K.; McClintic, Robert P.; and Vanderpool, Clarence D., 4,612,180, Cl. 423-593.000.
Kim, Tai K.; MacInnis, Martin B.; and McClintic, Robert P., 4,612,182, Cl. 423-593.000.
Kim, Tai K.; Boyer, Carl W.; MacInnis, Martin B.; and Ennis, Donald H., 4,612,183, Cl. 423-593.000.
Morgan, Ricky D.; Sylvester, Vito P.; and Ward, Robert L., 4,612,162, Cl. 419-28.000.
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.
Scheithauer, Richard A.; Vanderpool, Clarence D.; and Miller, Michael J., 4,612,039, Cl. 75-0.5AA.
Guerrero, Hector N., to Combustion Engineering Co., Inc. Method of and apparatus for providing an annular seal. 4,611,813, Cl. 277-1.000.
Guest, Leonard E.: *See*—
Kelly, John H.; and Guest, Leonard E., 4,612,042, Cl. 75-24.000.
Guiglini, Jean-Yves M.: *See*—
Da Silva, Jean P. X.; and Guiglini, Jean-Yves M., 4,612,544, Cl. 343-5.0DP.
Gunda, Rajamouli, to Vickers, Incorporated. Power transmission. 4,612,489, Cl. 318-590.000.
Gupton, Frank; and Ulmer, Harry E., to Virginia Chemicals Inc. Treatment of waste stream from pentaerythritol manufacture. 4,612,389, Cl. 562-513.000.
Gurevich, Leon; and Spaunhorst, Vernon, to Cooper Industries, Inc. Subminiature fuse. 4,612,529, Cl. 337-255.000.
Guth, Christian: *See*—
Schafer, Paul; Abel, Heinz; Guth, Christian; and Stehlin, Albert, 4,612,352, Cl. 525-404.000.
Guttinger, Heinz, to Sulzer-Escher Wyss Limited. Method and apparatus for rolling metal foils. 4,611,479, Cl. 72-16.000.
Guzowski, Matthew M.; Sentner, David A.; and Sigworth, Geoffrey K., to Cabot Corporation. Aluminum grain refiner containing duplex crystals. 4,612,073, Cl. 148-415.000.
H&E Machine Company: *See*—
Heitzman, Robert L., 4,611,379, Cl. 29-426.500.
Haas, John L., to Roco Tool Group, Inc. Collapsible carrier stand for heavy machine. 4,611,823, Cl. 280-641.000.
Haase, Robert. Bingo game with means to change part of the bingo pattern. 4,611,811, Cl. 273-237.000.
Haberle, Friedrich: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,611,959, Cl. 408-180.000.
Hadaway, Bernard M., to REPCO Limited. Press and method of making same. 4,611,483, Cl. 72-453.020.
Haeuser, Erhard; and Hedrich, Wilhelm, to Wilhelm Hedrich Vacuumanlagen GmbH & Co. KG. Injection-molding system for the processing of casting resin. 4,611,982, Cl. 425-543.000.
Hafner, Hans W., to Pfister GmbH. Automatic metering apparatus. 4,611,731, Cl. 222-636.000.
Hagerty, Lloyd A. Radius corner forming apparatus and method. 4,611,519, Cl. 83-389.000.
Hagiwara, Akihiro: *See*—
Miyanaga, Choshichi; Sakurai, Yoshihiko; Iida, Katsumi; and Hagiwara, Akihiro, 4,611,755, Cl. 236-13.000.
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, to Cosden Technology, Inc. Apparatus for forming multilayer thermoplastic resin extrusions. 4,611,987, Cl. 425-131.100.
Hakli, Marja H., to Lannen Tehtaat Oy. Method and equipment for planting of band ball plants. 4,611,428, Cl. 47-86.000.
Halbritter, Wilfried, to Positron Gesellschaft fur Anlagen zur Verformung thermoplastischer Massen mbH. Machine for making pressed glass parts. 4,612,033, Cl. 65-313.000.
Hall, James W.; Popelier, Maurice A.; and Leemans, Daniel L., to Deere & Company. Axial flow rotary separator. 4,611,605, Cl. 130-23.000.
Hall, James W.; and Popelier, Maurice A., to Deere & Company. Feeding arrangement for an axial flow rotary separator. 4,611,606, Cl. 130-23.000.
Hall, Keith J.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., to AMP Incorporated. Electrical plug connector. 4,611,878, Cl. 339-186.00M.
Hama, Fumio; Suzuki, Toshitake; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co. Ltd. Hydroxydiphenyl sulfone derivative and heat-sensitive recording material using the derivative. 4,612,557, Cl. 346-216.000.
Hamacher, Edward N.; and Stolle, Mark A. Infiltration pump. 4,612,010, Cl. 604-207.000.
Hamada, Fukusaburo: *See*—
Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, 4,612,283, Cl. 435-68.000.
Hamaguchi, Masaki: *See*—
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Flexible photovoltaic device. 4,612,409, Cl. 136-244.000.
Hamamatsu Photonics Kabushiki Kaisha: *See*—
Tsuchiya, Yutaka, 4,611,920, Cl. 356-318.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Print head. 4,611,537, Cl. 101-111.000.
Hamm, Ronald L.: *See*—
Massey, Harold E., Sr.; and Hamm, Ronald L., 4,611,820, Cl. 280-414.200.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,612,305, Cl. 514-80.000.
Hammond, John E.: *See*—
Engel, Robert; Gobel, Adolph P., IV; Hammond, John E.; and Glatz, Alfred C., 4,612,202, Cl. 426-548.000.
Hamon, Ray C., to Ashland Oil, Inc. Carbodiimide driers for resin coating compositions. 4,612,054, Cl. 106-264.000.
Hampton, Douglas R. Fishing lure with separable body and hook track. 4,611,422, Cl. 43-42.360.
Hamren, Glen C., to General Motors Corporation. Circuit for controlling and indicating fuel injector operation. 4,612,597, Cl. 361-152.000.
Hand, Patricia H.: *See*—
Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,612,282, Cl. 435-68.000.
Hanrahan, James L.: *See*—
Westdale, Virgil W.; and Hanrahan, James L., 4,612,269, Cl. 430-49.000.
Westdale, Virgil W.; and Hanrahan, James L., 4,612,273, Cl. 430-98.000.
Hansen, Holger, to Autoflug GmbH. Emergency transmitter and method of operating the same. 4,612,667, Cl. 455-98.000.
Hanson, Donald L.: *See*—
Woffinden, Gary A.; Hanson, Donald L.; and Amdahl, Gene M., 4,612,612, Cl. 364-200.000.
Hansson, Gunnar C., to Atlas Copco Aktiebolag. Vibration insulating handle. 4,611,671, Cl. 173-162.00H.

Haq, Zia: *See—*
Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,612,334, Cl. 521-146.000.

Hara, Hirofumi, to Kabushiki Kaisha Komatsu Seisakusho. Closed die forging apparatus. 4,611,482, Cl. 72-354.000.

Hara, Hiroshi: *See—*
Whitney, Wayne T.; and Hara, Hiroshi, 4,612,642, Cl. 372-33.000.

Hara, Masahara; and Dobashi, Toshio, to Nippon Kogaku K. K. Segment indication device. 4,611,897, Cl. 354-475.000.

Harada, Jun: *See—*
Nishio, Hiroaki; Ueno, Yasushi; and Harada, Jun, 4,612,163, Cl. 419-68.000.

Harada, Nozomu: *See—*
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,612,581, Cl. 358-213.000.

Harari, Eliyahou. Highly scalable dynamic RAM cell with self-signal amplification. 4,612,629, Cl. 365-185.000.

Hardesty, Edwin C.: *See—*
Clarke, John E.; Hardesty, Edwin C.; and Reichard, George W., Jr., 4,611,875, Cl. 339-154.00A.

Harkness, John B. L.; Doctor, Richard D.; and Wingender, Ronald J., to United States of America, Energy. Flue gas desulfurization/denitrification using metal-chelate additives. 4,612,175, Cl. 423-235.000.

Harlander, Donald C.: *See—*
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,611,817, Cl. 280-145.000.

Harman, R. Keith, to Senstar Security Systems, Corporation. Dual velocity leaky cable intrusion detector sensor. 4,612,536, Cl. 340-552.000.

Harrington, John P., to Amoco Corporation. Remotely operable releasable pipe connector. 4,611,662, Cl. 166-339.000.

Harris Corporation: *See—*
Rosier, Brian K., 4,612,630, Cl. 365-201.000.

Harris, Foster R.: *See—*
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.

Harris Graphics Corporation: *See—*
Miaskoff, Leonard; and Merwarth, Richard J., 4,611,533, Cl. 100-7.000.

Harsanyi, Jozsef; and Papp, Janos, to CHINOIN Gyogyszer es Vegyeszeti Termekek Gyara Rt. Crushing equipment with air-jet, in particular for crystalline materials. 4,611,764, Cl. 241-39.000.

Harsco Corporation: *See—*
Gallis, Anthony J., 4,611,784, Cl. 249-20.000.

Hartenstein, Johannes: *See—*
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.

Hartmeier, Werner N.: *See—*
den Hollander, Willem; and Hartmeier, Werner N., 4,612,568, Cl. 358-19.000.

Hartz, Marvin E.: *See—*
Peppler, Dennis L.; Zaman, Mohammad F.; Bornstein, Norman S.; and Hartz, Marvin E., 4,611,747, Cl. 228-125.000.

Haruyama, Akira, to Nippon Thompson Co., Ltd. Linear motion rolling contact bearing having a double row runway. 4,611,861, Cl. 384-49.000.

Hashimoto, Akio: *See—*
Yasuda, Tomino; and Hashimoto, Akio, 4,611,682, Cl. 180-79.100.

Hattori, Masahiro: *See—*
Tomiyasu, Hiroshi; Hattori, Masahiro; and Itoh, Yoshio, 4,611,763, Cl. 241-30.000.

Haubold, Herbert; and Burg, Bernhard, to Akzona Incorporated. Process for the manufacture of hydrophilic polyester fibers. 4,612,147, Cl. 264-46.100.

Hauptmann, Edward G., to Devron Engineering Ltd. Surge suppression device. 4,612,089, Cl. 162-336.000.

Hawrylo, Frank Z.; and Kowger, Henry V., deceased (by Kowger, Dorothy J., executrix), to RCA Corporation. Selective semiconductor coating and protective mask therefor. 4,612,211, Cl. 427-86.000.

Hayama, Hiroshi: *See—*
Yasumoto, Masaaki; Hayama, Hiroshi; and Enomoto, Tadayoshi, 4,612,083, Cl. 156-633.000.

Hayasaka, Toshiaki: *See—*
Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, 4,612,418, Cl. 179-81.00R.

Hayashi, Kiyotaka; Ohzono, Kohei; and Yakigaya, Nobuyuki, to Honda Giken Kogyo K.K. Device for controlling pinch force of a pulley in an infinitely variable transmission. 4,612,002, Cl. 474-28.000.

Hayashi, Kiyotaka: *See—*
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, 4,612,003, Cl. 474-28.000.

Hayashi, Mishio, to Takeda Riken Kogyo Kabushikikaisha. Time interval measuring instrument. 4,611,926, Cl. 368-120.000.

Hayashi, Toshihiro: *See—*
Matsui, Kazuhiro; Wada, Hideo; Nakano, Yoshihito; and Hayashi, Toshihiro, 4,611,868, Cl. 339-59.00M.

Haynes, Hendrick W. Marine propulsion device with gaseous boundary layer for thrust jet flow stream. 4,611,999, Cl. 440-47.000.

Hays, Kenneth E.: *See—*
Davis, Dean T.; and Hays, Kenneth E., 4,612,620, Cl. 364-551.000.

Hazebrook, Daniel W., to GKN Automotive Components. Method of forming a precision ball track. 4,611,373, Cl. 29-148.40C.

Hazebrook, Daniel W.: *See—*
Krude, Werner; and Hazebrook, Daniel W., 4,611,681, Cl. 180-73.400.

Heckaman, Curtis R. Tie and belt rack. 4,611,721, Cl. 211-100.000.

Hed, Jon E.; and Draper, Robert B., to Vetco Offshore Industries, Inc. Retrievable exploration guide base/completion guide base system. 4,611,661, Cl. 166-339.000.

Hedrich, Wilhelm: *See—*
Haeuser, Erhard; and Hedrich, Wilhelm, 4,611,982, Cl. 425-543.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Esterified polycyanate compositions and thermoset resins thereof. 4,612,359, Cl. 528-97.000.

Hegenstaller, Anton; and Spies, Xaver, to Hegenstaller, Anton. Process and apparatus for extrusion of composite structural members. 4,611,979, Cl. 425-376.00R.

Heid, Georg: *See—*
Stoll, Kurt; Heid, Georg; Schrag, Gerhard; and Wagner, Albrecht, 4,611,530, Cl. 92-13.500.

Heilmann, Wolfgang; Lenze, Friedrich; Missaire, Gerhard; and Winter, Friedrich, to Mannesmann Aktiengesellschaft. Fluidtight pipe joint. 4,611,838, Cl. 285-331.000.

Heimes, Horst P., to Forschungsgesellschaft fur Biomedizinischs Technik E.V. Goethestrasse. Redundant piston pump for the operation of single or multiple chambered pneumatic blood pumps. 4,611,578, Cl. 128-1.00D.

Hein, Richard W., to Mooney Chemicals, Inc. Water dispersible compositions for preparing aqueous water repellent systems, aqueous water repellent systems, and process for treatment of permeable substrates therewith. 4,612,255, Cl. 428-541.000.

Heinemann Electric Company: *See—*
Mercer, James M., 4,612,523, Cl. 335-26.000.

Heinemeyer, Ben W.; and Tatum, Sammy D., to Dow Chemical Company, The. Solventless process for producing resinous materials. 4,612,156, Cl. 264-176.00R.

Heinix, Lucien J. C., to Alphadent. Apparatus for fixing a plaster cast in an articulator for the production of dental prostheses. 4,611,991, Cl. 433-60.000.

Heinrich-Hertz-Institute fur Nachrichtentechnik Berlin GmbH: *See—*
Fabian, Werner; Roehle, Helmut; and Wolfram, Peter, 4,612,174, Cl. 423-210.000.

Heitmann, Knut; Hoppe, Martin; Schneider, Eckhard; and Thaer, Andreas, to Ernst Leitz Wetzlar GmbH. Process for producing structures in resist layers using ultrasonic irradiation. 4,612,267, Cl. 430-3.000.

Heitzman, Robert L., to H&E Machine Company. Method of removably securing a security threaded fastener apparatus. 4,611,379, Cl. 29-426.500.

Heizer, Marshall B., Jr. Vehicle-operated gate. 4,611,433, Cl. 49-242.000.

Helix Limited: *See—*
Warwicker, Clive W., 4,611,711, Cl. 206-0.810.

Helix Technology Corporation: *See—*
Peterson, John F., 4,611,467, Cl. 62-55.500.

Henderson, J. Kirston, to General Dynamics Corporation. Electro-optical connection between electronic modules. 4,612,670, Cl. 455-607.000.

Henkel Corporation: *See—*
Virnig, Michael J., 4,612,403, Cl. 568-454.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Geke, Juergen; and Meyer, Dieter, 4,612,058, Cl. 134-38.000.
Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, 4,612,142, Cl. 252-555.000.
Scheuffgen, Ingeborg; and Meffert, Alfred, 4,612,192, Cl. 424-70.000.

Henkes, Erhard: *See—*
Burstinghaus, Rainer; Henkes, Erhard; Kiehs, Karl; and Adolphi, Heinrich, 4,612,306, Cl. 514-112.000.

Hennechart, Jean-Paul; Bramaud, Bernard; and Prat, Francois, to Ziegler S.A. Process and installation for the continuous application of an oxidizable coating to a strip. 4,612,215, Cl. 427-19.00R.

Henning, Manfred: *See—*
Gilz, Gunter; and Henning, Manfred, 4,612,450, Cl. 307-264.000.

Henry Ford Hospital: *See—*
Wu, Kent K., 4,611,580, Cl. 128-69.000.

Heraeus Quarzschmelze GmbH: *See—*
Kreutzer, Karl; and Simmat, Fritz, 4,612,023, Cl. 65-32.000.

Herb, Armin: *See—*
Frohlich, Peter; and Herb, Armin, 4,611,963, Cl. 411-54.000.

Herberts Gesellschaft mit beschrankter Haftung: *See—*
Schlinsog, Hans-Jurgen; and Kowalzik, Siegfried, 4,612,107, Cl. 204-300.0EC.

Hermann, George D.: *See—*
Fogarty, Thomas J.; Finn, James C., III; Kinney, Thomas B.; and Hermann, George D., 4,611,593, Cl. 128-325.000.

Hermansson, Jorgen L. E., to ChromTech AB. Separation material, methods of producing a separation material and use of orosomucoid, functional analogs thereto or derivatives or fragments thereof for separation purposes. 4,612,121, Cl. 210-635.000.

Hess, Garry C.: *See—*
Zdunek, Kenneth J.; and Hess, Garry C., 4,612,415, Cl. 179-2.0EB.

Hess, Roland H. P., to Dow Chemical Company, The. Hydroxypropyl methyl cellulose ethers useful as suspending agents for suspension polymerization of vinyl chloride. 4,612,345, Cl. 524-733.000.

Hettinger, William P., Jr.; and Beck, Hubert W., to Ashland Oil, Inc. Carbo-metallic oil conversion catalysts. 4,612,298, Cl. 502-65.000.

Hetzer, Frederick C.; and Miller, Guy W., to United Technologies Corporation. Rotor assembly for a gas turbine engine and method of disassembly. 4,611,464, Cl. 60-39.161.

Hewig, Gert; Huschka, Hans; Schurich, Bernd; and Worner, Jorg, to Nukem GmbH. Contact system for thin film solar cells. 4,612,410, Cl. 136-256.000.

Hewitt, Ronnie D. Irrigation valve control apparatus. 4,611,617, Cl. 137-68.100.

Hibert, Marcel; and Gittos, Maurice W., to Merrell Dow Pharmaceuticals Inc. Glutarimide antianxiety and antihypertensive agents. 4,612,312, Cl. 514-225.000.

Hicks, Hamilton. Sodium silicate composition. 4,612,050, Cl. 106-18.120.

Hickson, Russell L.; and Weber, James L., to Rockwell International Corporation. Mounting pin seals for disc brake calipers. 4,611,694, Cl. 188-73.450.

Hideo, Suzuki, to Nippon Gakki Seizo Kabushiki Kaisha. Tone wave synthesizing apparatus. 4,611,522, Cl. 84-1.010.

Hierzenberger, Kurt. Internal-combustion engine. 4,611,557, Cl. 123-25.00B.

Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Method and apparatus for monitoring the operating readiness of power chuck. 4,611,814, Cl. 279-111.000.

Higuchi, Chojiro: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; and Yamaguchi, Akihiro, 4,612,388, Cl. 562-443.000.

Hildebrandt, Arno, to Jagenberg Aktiengesellschaft. Device for introducing a web of material into a processing machine. 4,611,518, Cl. 83-105.000.

Hill, Charles A.: *See*—
Johnson, Thomas A.; and Hill, Charles A., 4,612,240, Cl. 428-289.000.

Hill, Deborah J.: *See*—
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.

Hill, John C.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.

Hilmer, Elwyn P. Farm tractor. 4,611,683, Cl. 180-209.000.

Hilti Aktiengesellschaft: *See*—
Chromy, Franz, 4,611,670, Cl. 175-116.000.
Frohlich, Peter; and Herb, Armin, 4,611,963, Cl. 411-54.000.
Jochum, Peter, 4,611,738, Cl. 227-9.000.

Hindman, David B; and Lima, Joseph D., to French Systems, Inc. Backwashable filtering apparatus and novel filter element therefor. 4,612,116, Cl. 210-333.100.

Hines, John R., to Motorola, Inc. Linear voltage-to-current converter. 4,612,496, Cl. 323-315.000.

Hinn, Werner, to RCA Corporation. Automatic kinescope bias system with AC coupled video output stage. 4,612,576, Cl. 358-171.000.

Hinrichs, Lansing M.: *See*—
Kretchmer, Richard A.; and Hinrichs, Lansing M., 4,612,177, Cl. 423-244.000.

Hiromichi, Hayashi: *See*—
Hori, Tomoshige; Kako, Masatoshi; and Hiromichi, Hayashi, 4,611,928, Cl. 374-21.000.

Hirose, Yasuo: *See*—
Abe, Ryusuke; Shimizu, Makoto; and Hirose, Yasuo, 4,612,159, Cl. 376-351.000.

Hirschmanner, Franz: *See*—
Buchegger, Rudolf; and Hirschmanner, Franz, 4,611,988, Cl. 432-183.000.

Hitachi Cable, Ltd.: *See*—
Katsuyama, Toshio; Satoh, Shin; and Matsumura, Hiroyoshi, 4,612,294, Cl. 501-40.000.

Hitachi, Ltd.: *See*—
Abe, Ryusuke; Shimizu, Makoto; and Hirose, Yasuo, 4,612,159, Cl. 376-351.000.
Furuta, Yoshiteru; and Nomura, Yasushi, 4,612,289, Cl. 436-34.000.
Hongou, Jinichi; Homma, Yoshifumi; Ito, Shoichi; and Tatsuno, Kimio, 4,612,555, Cl. 346-160.000.
Katsuyama, Toshio; Satoh, Shin; and Matsumura, Hiroyoshi, 4,612,294, Cl. 501-40.000.
Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, 4,612,561, Cl. 357-38.000.
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, 4,612,451, Cl. 307-270.000.
Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, 4,612,268, Cl. 430-28.000.
Sakamoto, Hiroshi; and Miyoshi, Tadahiko, 4,612,296, Cl. 501-93.000.
Shimizu, Shinji; and Miyazawa, Hiroyuki, 4,612,565, Cl. 357-71.000.
Shimomura, Raiji, 4,612,487, Cl. 318-568.000.
Takase, Osamu; and Kuroyanagi, Tomomitsu, 4,612,585, Cl. 358-316.000.
Tsukui, Tsutomu; Shimizu, Toshio; and Doi, Ryouta, 4,612,261, Cl. 429-13.000.
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, 4,612,127, Cl. 252-32.500.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,612,128, Cl. 252-32.500.

Hitachi Metals, Ltd.: *See*—
Watanabe, Rikizo; and Sakamoto, Daizi, 4,612,167, Cl. 420-471.000.

Hitotsuyanagi, Hajime; Igarashi, Tadashi; Ishii, Masayuki; and Kobayashi, Tadakazu, to Director General of Agency of Industrial Science & Technology. Solar cell of amorphous silicon. 4,612,559, Cl. 357-2.000.

Hiyama, Torao: *See*—
Kowata, Masakatsu; and Hiyama, Torao, 4,612,566, Cl. 357-80.000.

Hjort, John S. M.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

Hocheng Pottery Mfg. Co., Ltd.: *See*—
Lin, Yeh-Huong, 4,611,356, Cl. 4-301.000.

Hochmuth, Walter; and Hollfelder, Hans-Peter, to Zinner GmbH. Metal working cutting tool. 4,611,516, Cl. 82-1.200.

Hodgkins, Charles E., to TAM Ceramics Inc. Low fire ceramic compositions. 4,612,600, Cl. 361-321.000.

Hodogaya Chemical Co., Ltd.: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.

Hoechst Aktiengesellschaft: *See*—
Koller, Wolfgang; and Papenfuhs, Theodor, 4,612,396, Cl. 564-441.000.
Schon, Klaus-Peter, 4,611,902, Cl. 355-3.0FU.

Hofer, Donald C.; LaVergne, Debra B.; Twieg, Robert J.; and Volksen, Willi, to International Business Machines Corporation. Process for planarizing a substrate. 4,612,210, Cl. 427-82.000.

Hoffer, John C.: *See*—
Glover, Douglas W.; Hoffer, John C.; Johnson, Erlon F.; and Schaffer, Ronald R., 4,611,887, Cl. 350-96.210.

Hofferber, James A., to Phillips Petroleum Company. Control of a crude oil preheat furnace. 4,612,111, Cl. 208-350.000.

Hoffman, Michael E.; and Stevenson, Roy, to Cutting Room Appliances Corp. Cloth spreading apparatus. 4,611,798, Cl. 270-31.000.

Hoffman, Theodore H.: *See*—
Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., 4,611,984, Cl. 431-19.000.

Hoffmann-La Roche Inc.: *See*—
Baggiolini, Enrico G.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,612,308, Cl. 514-167.000.
Cashin, Colin H.; Roberts, Noel A.; and Tong, Brian P., 4,612,324, Cl. 514-400.000.
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,612,380, Cl. 549-415.000.

Hofmann, Heinrich; and Ulsenheimer, Horst, to FAG Kugelfischer Georg Schafter (KGaA). Fastening of anti-friction bearings. 4,611,933, Cl. 384-512.000.

Hogan, Robert J.: *See*—
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., 4,612,110, Cl. 208-251.00H.

Hohage, Heinz-Juergen: *See*—
Besecke, Siegmund; Liebler, Ralf; Hohage, Heinz-Juergen; and Schroeder, Guenter, 4,612,358, Cl. 526-259.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.

Holbrook, Kyle A.; and Yacavone, Michael J. Multichannel audio reproduction system. 4,612,663, Cl. 381-24.000.

Holder, Paula M.: *See*—
Pampalone, Thomas R.; and Holder, Paula M., 4,612,270, Cl. 430-273.000.

Holl, Helmar, to Dorina Nahmaschinen GmbH. Top transport for sewing machines. 4,611,548, Cl. 112-311.000.

Holland, George W.; Rosen, Perry; and Maag, Hans, to Hoffmann-La Roche Inc. 7-fluoro-prostacyclin analogs. 4,612,380, Cl. 549-415.000.

Holland, John H. Hydraulically operated well pump system. 4,611,974, Cl. 417-388.000.

Holland Wire Products, Inc.: *See*—
Baker, Garland A.; and Powers, Ronald S., 4,611,640, Cl. 140-92.300.

Hollfelder, Hans-Peter: *See*—
Hochmuth, Walter; and Hollfelder, Hans-Peter, 4,611,516, Cl. 82-1.200.

Hollingsworth GmbH: *See*—
Schmolke, Karl-Heinz, 4,612,084, Cl. 156-639.000.

Hollingsworth (U.K.) Ltd.: *See*—
Parker, Alan, 4,611,366, Cl. 19-236.000.
Smith, Alan; and Yates, Stephen W., 4,611,463, Cl. 57-263.000.

Hollowick Inc.: *See*—
Menter, J. Alan; and Menter, Gerald A., 4,611,986, Cl. 431-320.000.

Holmes, John P.; and Froud, Roderick W., to Cogent Ltd. Electrochemical cell. 4,612,104, Cl. 204-272.000.

Holmstrom, Sven A., to Boliden Aktiebolag. Method for recovering metal values from materials containing copper and/or precious metals. 4,612,171, Cl. 423-22.000.

Holyer, Ronald J., to United States of America, Navy. Satellite method for measuring sea surface temperature. 4,611,929, Cl. 374-124.000.

Holzl, Kurt, to Vereinigte Edelstahlwerke Aktiengesellschaft. Drill bit. 4,611,672, Cl. 175-339.000.

Homeyer, Bernhard: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,612,305, Cl. 514-80.000.

Homma, Mitsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sunbeam incident angle detecting device. 4,611,914, Cl. 356-141.000.

Homma, Naoshi; and Sato, Jin, to Eisai Co., Ltd. Therapeutic and/or preventive agent for obstructive respiratory diseases. 4,612,303, Cl. 514-23.000.

Homma, Yoshifumi: *See*—
Hongou, Jinichi; Homma, Yoshifumi; Ito, Shoichi; and Tatsuno, Kimio, 4,612,555, Cl. 346-160.000.

Honda Giken Kogyo K.K.: *See*—
Hayashi, Kiyotaka; Ohzono, Kohei; and Yakigaya, Nobuyuki, 4,612,002, Cl. 474-28.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Yakuwa, Masahiko, 4,611,565, Cl. 123-479.000.
Yanagishita, Masami; and Ogita, Yasunori, 4,611,679, Cl. 180-68.300.

Honda Giken Koygo K.K.: *See*—
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, 4,612,003, Cl. 474-28.000.

Honda, Hirosi. Device for replacing fluorescent lamps. 4,611,512, Cl. 81-53.100.

Honda, Michitaka: *See*—
Komatsu, Kenichi; and Honda, Michitaka, 4,612,572, Cl. 358-111.000.

Honda, Yoshihiko: *See*—
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.

Honeywell Inc.: *See*—
Culp, Charles H., 4,612,619, Cl. 364-492.000.
Isely, William H., 4,611,863, Cl. 310-90.500.
Lam, Ken; Pond, John H.; and Wilda, Douglas W., 4,612,227, Cl. 428-137.000.
Leete, Tom G., 4,612,635, Cl. 370-89.000.
Mykkanen, C. Fred, 4,611,511, Cl. 81-9.440.
Pantry, William J.; and Baumann, Burke B., 4,612,542, Cl. 340-825.500.
Payne, Peter P., 4,611,619, Cl. 137-82.000.
Zansky, Zoltan, 4,612,479, Cl. 315-194.000.

Hongou, Jinichi; Homma, Yoshifumi; Ito, Shoichi; and Tatsuno, Kimio, to Hitachi, Ltd. Laser beam scanner apparatus. 4,612,555, Cl. 346-160.000.

Hoppe, Martin: *See*—
Heitmann, Knut; Hoppe, Martin; Schneider, Eckhard; and Thaer, Andreas, 4,612,267, Cl. 430-3.000.

Hori, Akio: *See*—
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.

Hori, Koichiro: *See*—
Prenovitz, Melvin B.; and Hori, Koichiro, 4,611,888, Cl. 350-96.220.

Hori, Shinichi: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.

Hori, Tomoshige; Kako, Masatoshi; and Hiromichi, Hayashi, to Snow Brand Milk Products Co., Ltd. Method for measuring coagulation of milk. 4,611,928, Cl. 374-21.000.

Horie, Seiji: *See*—
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,612,271, Cl. 430-72.000.

Horigome, Kazuo: *See*—
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.

Horii, Kingo: *See*—
Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, 4,611,568, Cl. 123-559.000.

Hortmann GmbH: *See*—
Hortmann, Guenter; and Kunick, Klaus, 4,611,598, Cl. 128-419.00R.

Hortmann, Guenter; and Kunick, Klaus, to Hortmann GmbH. Multi-frequency transmission system for implanted hearing aids. 4,611,598, Cl. 128-419.00R.

Horvath, Csaba: *See*—
Ambrus, Clara; and Horvath, Csaba, 4,612,122, Cl. 210-638.000.

Hosoe, Hirotaro: *See*—
Iwata, Isamu; Hosoe, Hirotaro; and Matsuoka, Yuji, 4,611,553, Cl. 118-50.000.

Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, to Alps Electric Co., Ltd. X—Y position input device for display system. 4,612,539, Cl. 340-710.000.

Hosokawa, Tsuyoshi: *See*—
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.

Houde, Donald J.: *See*—
Bacon, Francis L.; and Houde, Donald J., 4,612,532, Cl. 340-347.0DD.

Hovland, Lyle W.; and Klingensmith, James D., to Aluminum Company of America. Dish antennae mounting structure. 4,612,552, Cl. 343-880.000.

Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Impact resistant composites with elastomeric fibers. 4,612,241, Cl. 428-294.000.

Hoya Corporation: *See*—
Sagara, Hiroji, 4,612,295, Cl. 501-51.000.

Hoyle, William: *See*—
Berner, Godwin; Hoyle, William; and Jack, James, 4,612,049, Cl. 106-14.130.

Hrubes, James J. Assembly for forming water retaining pockets and levelling the ground surface. 4,611,668, Cl. 172-134.000.

Hsu, Grace F.; and Colonel, Richard C., to Boeing Company, The. Coating for increasing corrosion resistance and reducing hydrogen reembrittlement of metal articles. 4,612,236, Cl. 428-216.000.

Huang, Huey W., to United States of America, Navy. Time resolved extended X-ray absorption fine structure spectrometer. 4,612,660, Cl. 378-44.000.

Hubbard, John D.; and Kerivan, Leo J., to Precision Handling Devices Inc. Tractor apparatus. 4,611,737, Cl. 226-74.000.

Hubert, Jerome: *See*—
Nicco, Adrien; Hubert, Jerome; Druz, Jacques; and Lambla, Morand, 4,612,349, Cl. 525-117.000.

Hudson, Thomas J.: *See*—
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.

Huffman, Connie K. A., to General Foods Inc. Incorporation of a clouding agent into a dry beverage mix. 4,612,204, Cl. 426-590.000.

Huffman, Samuel L., to Carolina Plating Works. Reed for looms. 4,611,637, Cl. 139-192.000.

Hughes Aircraft Company: *See*—
Farnsworth, Robert P.; and Nesler, John J., 4,612,610, Cl. 363-26.000.
Myer, Jon H., 4,611,883, Cl. 350-96.120.
Rosen, Harold A., 4,612,546, Cl. 343-352.000.

Hughes, David W., to Vetco Offshore Industries, Inc. Misalignment tieback tool - swivel connection. 4,611,829, Cl. 285-18.000.

Hughes, Ralph O.: *See*—
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,611,817, Cl. 280-145.000.

Hunt, C. Anthony, to University of California, The Regents of the. Lipid-saccharide reaction products. 4,612,370, Cl. 536-5.000.

Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,611,648, Cl. 160-107.000.

Huschka, Hans: *See*—
Hewig, Gert; Huschka, Hans; Schurich, Bernd; and Worner, Jorg, 4,612,410, Cl. 136-256.000.

Hustead, Russell M.: *See*—
Kelso, Jimmie J.; and Hustead, Russell M., 4,611,603, Cl. 128-775.000.

Huther, Werner, to MTU Motoren- und Turbinen-Union Munchen GmbH. Process for the hot-isostatic compression of ceramic shaped parts. 4,612,146, Cl. 264-29.600.

Hutson, Frederick O., to Gemtron Corporation. Display case with improved shelf and rod brackets. 4,611,717, Cl. 211-34.000.

Huwyler, Rene : *See*—
Forgo, Imre; Huwyler, Rene ; and Francois, Jacques, 4,612,209, Cl. 427-54.100.

Hyde, Henry D. Multi-purpose socket ratchet wrench. 4,611,514, Cl. 81-60.000.

Hydril Company: *See*—
Muchow, John D.; and Pelata, Kenneth L., 4,611,630, Cl. 137-625.370.

Ianitelli, Pingree; and Fleury, Kerry G. Closed loop humidifier for institutions. 4,612,434, Cl. 219-273.000.

Ichijo, Kohji: *See*—
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,611,549, Cl. 114-144.00E.

Ichikawa, Hiromichi: *See*—
Oyobe, Masaaki; Ichikawa, Hiromichi; and Maeyama, Tsutomu, 4,612,189, Cl. 424-49.000.

Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, to Japan Aviation Electronics Industry Limited; and NEC Corporation. Coaxial multicore receptacle. 4,611,867, Cl. 339-14.00R.

Ichinose, Izumi, to Asaka Co., Ltd. Video editing viewer. 4,612,569, Cl. 358-22.000.

Ida, Yuichi: *See*—
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,612,539, Cl. 340-710.000.

Igarashi, Kenji: *See*—
Kawasaki, Youichi; and Igarashi, Kenji, 4,612,139, Cl. 252-511.000.

Igarashi, Tadashi: *See*—
Hitotsuyanagi, Hajime; Igarashi, Tadashi; Ishii, Masayuki; and Kobayashi, Tadakazu, 4,612,559, Cl. 357-2.000.

Igersheim, Francoise: *See*—
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,612,401, Cl. 568-362.000.

Iida, Katsumi: *See*—
Miyanaga, Choshichi; Sakurai, Yoshihiko; Iida, Katsumi; and Hagiwara, Akihiro, 4,611,755, Cl. 236-13.000.

Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, to Tanabe Seiyaku Co., Ltd. Tetrahydro-β-carboline dithioic acid derivatives and treatment of liver diseases. 4,612,317, Cl. 514-292.000.

Iijima, Takeo; and Sano, Hiroyuki, to Nisshin Chemicals Co., Ltd. Oryzanol-containing soft capsule. 4,612,187, Cl. 424-16.000.

Iizuka, Hisakazu: *See*—
Masuoka, Fujio; and Iizuka, Hisakazu, 4,612,212, Cl. 427-91.000.

Ikeda, Takashi: *See*—
Ikesue, Masumi; and Ikeda, Takashi, 4,611,730, Cl. 222-167.000.
Ikemura, Akio; and Kajiki, Minoru, to Yoshida Kogyo K. K. Ventilation system. 4,611,653, Cl. 165-54.000.
Ikesue, Masumi; and Ikeda, Takashi, to Ricoh Company, Ltd. Toner replenishing device. 4,611,730, Cl. 222-167.000.
Ikeura, Hiroo: *See*—
Nishida, Shigeki; and Ikeura, Hiroo, 4,611,918, Cl. 356-404.000.
Illinois Tool Works Inc.: *See*—
Engstrom, Keith A.; and Frederiksen, Bjarne, 4,611,406, Cl. 33-443.000.
Imada, Ruyzo: *See*—
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.
Imamura, Nobutake: *See*—
Tanaka, Shinsuke; and Imamura, Nobutake, 4,612,068, Cl. 148-301.000.
Imperial Chemical Industries PLC: *See*—
Clough, John M., 4,612,381, Cl. 549-560.000.
Colquhoun, Howard M.; and Lewis, David F., 4,612,399, Cl. 568-324.000.
Gaitskell, John N., 4,612,222, Cl. 428-35.000.
Norris, Alan J., 4,612,598, Cl. 361-227.000.
Osborne, Robert; and Bailey, Kevin D., 4,612,377, Cl. 546-345.000.
Imperial Clevite Inc.: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,611,632, Cl. 137-625.650.
Inaba, Michihiko: *See*—
Suzuki, Fumio; Fujinuma, Makoto; Ohtake, Yasuhisa; and Inaba, Michihiko, 4,612,061, Cl. 148-6.350.
Inagaki, Yoshio; and Endo, Katsusuke, to Fuji Photo Film Co., Ltd. Image-receiving element for silver salt diffusion process with image stabilizer precursor. 4,612,277, Cl. 430-233.000.
Inami, Mamoru; and Tanaka, Yoshiaki, to Victor Company of Japan, Ltd. Graphic equalizer with spectrum analyzer and system thereof. 4,612,665, Cl. 381-98.000.
Inatsuki, Kenichi, to Fuji Photo Film Co., Ltd. Method of judging film frame position. 4,611,907, Cl. 355-41.000.
Inco Alloys International, Inc.: *See*—
Ramsey, Cecil L.; and Suarez, Francis S., 4,612,164, Cl. 420-455.000.
Industriewerk Nachf. Seifert & Co. KG: *See*—
Bossecker, Walter, 4,611,844, Cl. 294-86.410.
Inoue, Yoshimichi: *See*—
Arino, Masao; and Inoue, Yoshimichi, 4,611,526, Cl. 91-369.00A.
Inquimet Sociedad Anonima Industrial Comercial y Agraria: *See*—
Dominguez, Aurelio D., 4,612,086, Cl. 159-6.100.
Institut Francais du Petrole: *See*—
Saint-M'Leuz, Rene-Pierre, 4,611,952, Cl. 405-224.000.
Inter-Ikea AG: *See*—
Bengtsson, Borje, 4,611,943, Cl. 403-22.000.
Intermetro Industries Corporation: *See*—
Cohn, Robert J.; and Sudimak, Michael J., 4,611,718, Cl. 211-49.100.
International Business Machines Corporation: *See*—
Gregor, Lawrence V., 4,612,275, Cl. 430-296.000.
Hofer, Donald C.; LaVergne, Debra B.; Twieg, Robert J.; and Volksen, Willi, 4,612,210, Cl. 427-82.000.
Levine, Ernest N.; Lipschutz, Lewis D.; and Quinones, Horatio, 4,611,746, Cl. 228-123.000.
International Computers Limited: *See*—
Pratt, John M., 4,612,540, Cl. 340-793.000.
International Remote Imaging Systems, Inc.: *See*—
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,612,614, Cl. 364-415.000.
Intertherm Inc.: *See*—
Ahn, Hongsik, 4,611,622, Cl. 137-145.000.
Inui, Koichi; and Makita, Hiroshi, to Sharp Kabushiki Kaisha. Expiration valve control for automatic respirator. 4,611,591, Cl. 128-205.240.
IRD Mechanalysis, Inc.: *See*—
Davis, Dean T.; and Hays, Kenneth E., 4,612,620, Cl. 364-551.000.
Ireland, Thomas M.; Koller, Thomas J.; and Lancaster, Michael T., to Tektronix, Inc. Computer terminal stand. 4,611,777, Cl. 248-371.000.
Ireton, Carl. Device and method for the precision mounting of flexible printing plates. 4,611,539, Cl. 101-401.100.
Irimajiri, Kazuo: *See*—
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, 4,611,810, Cl. 273-218.000.
Irwin, Lawrence F. Pipe cleaning machine. 4,611,360, Cl. 15-104.3SN.
Iseler, Kenneth A.; and Wilkinson, Robert E., to Budd Company, The. Compression molding a charge using vacuum. 4,612,149, Cl. 264-101.000.
Isely, William H., to Honeywell Inc. Magnetically supported and torqued momentum reaction sphere. 4,611,863, Cl. 310-90.500.
Ishibashi, Takao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,611,562, Cl. 123-440.000.
Ishida, Haruhiko: *See*—
Kohyama, Mitsuaki; Kasai, Toshihiro; Ishida, Haruhiko; and Osawa, Shigenobu, 4,611,901, Cl. 355-4.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,611,370, Cl. 26-3.000.
Ishii, Masayuki: *See*—
Hitotsuyanagi, Hajime; Igarashi, Tadashi; Ishii, Masayuki; and Kobayashi, Tadakazu, 4,612,559, Cl. 357-2.000.
Ishii, Mitsuaki: *See*—
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.
Ishijima, Koji: *See*—
Wada, Fumio; Ishijima, Koji; Sano, Fumiaki; and Asami, Kazutomo, 4,611,473, Cl. 62-503.000.
Ishikawa, Fumio; and Tanaka, Kuninobu, to Sony Corporation. High speed buffer circuit particularly suited for use in sample and hold circuits. 4,612,464, Cl. 307-496.000.
Ishikura, Tomoyuki: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.
Ishino, Yasuo: *See*—
Komatsu, Takashi; and Ishino, Yasuo, 4,611,365, Cl. 15-339.000.
Ishiyama, Kazufumi: *See*—
Enjoji, Susumu; and Ishiyama, Kazufumi, 4,611,372, Cl. 29-25.350.
Ishizuka, Yutaka: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,611,977, Cl. 418-76.000.
Ishman, Neal H.; and Alderson, William S., to E-Systems, Inc. T.V. video image correction. 4,612,575, Cl. 358-160.000.
Ismail, Roshdy. Anti-rheumatic agents and their use. 4,612,194, Cl. 424-195.100.
Itek Corporation: *See*—
Asendorf, Robert H.; Fitzpatrick, James P.; and Graves, Burton W., 4,612,545, Cl. 343-18.00E.
Ito, Katsuya; and Yamada, Shinichi, to Tokai Electric Wire Company Limited. Water-proof connector. 4,611,872, Cl. 339-94.00M.
Ito, Kiyotaka: *See*—
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, 4,612,376, Cl. 544-317.000.
Ito, Satoshi: *See*—
Omata, Hiroyasu; Ito, Satoshi; and Murata, Tomomi, 4,612,095, Cl. 204-144.500.
Ito, Shoichi: *See*—
Hongou, Jinichi; Homma, Yoshifumi; Ito, Shoichi; and Tatsuno, Kimio, 4,612,555, Cl. 346-160.000.
Itoh, Shin-ichi, to NEC Corporation. Electronically scanned antenna. 4,612,547, Cl. 343-372.000.
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, to Hokuriku Pharmaceutical Co., Ltd. Pharmaceutical alpha-aminoalkyl-alpha-alkylphenylacetonitriles. 4,612,329, Cl. 514-523.000.
Itoh, Yoshio: *See*—
Tomiyasu, Hiroshi; Hattori, Masahiro; and Itoh, Yoshio, 4,611,763, Cl. 241-30.000.
ITT Corporation: *See*—
Kadin, Joseph, 4,612,652, Cl. 375-1.000.
Iwabuchi, Osamu: *See*—
Yamauchi, Takao; Suzuki, Hayato; Iwabuchi, Osamu; and Kishimoto, Toshinobu, 4,612,495, Cl. 322-100.000.
Iwabuchi, Takashi: *See*—
Miyata, Takeo; Ono, Takuhiro; and Iwabuchi, Takashi, 4,612,234, Cl. 428-215.000.
Iwahashi, Hiroshi: *See*—
Asano, Masamichi; and Iwahashi, Hiroshi, 4,612,462, Cl. 307-482.000.
Iwai, Kiyoshi: *See*—
Mandai, Haruhumi; Nakamura, Kazutaka; Naito, Yasuyuki; and Iwai, Kiyoshi, 4,612,140, Cl. 252-520.000.
Iwaki, Hiroshi, to Sanyo Electric Co., Ltd. Electrophotographic copying apparatus. 4,611,906, Cl. 355-14.00R.
Iwaki, Yoshiyuki: *See*—
Katashima, Tadashi; and Iwaki, Yoshiyuki, 4,612,493, Cl. 320-64.000.
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, to Snow Brand Milk Products Co. Ltd. Process for sterilization of enzyme contaminated by bacteria. 4,612,169, Cl. 422-32.000.
Iwashita, Tomonori, to Canon Kabushiki Kaisha. Electrically-driven camera. 4,611,896, Cl. 354-173.110.
Iwata, Isamu; Hosoe, Hirotaro; and Matsuoka, Yuji, to Fuji Photo Film Co., Ltd. Suction nozzle. 4,611,553, Cl. 118-50.000.
Izumi, Shunji: *See*—
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, 4,611,810, Cl. 273-218.000.
Izumina, Masanobu: *See*—
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,612,409, Cl. 136-244.000.
J. I. Case Company: *See*—
Redenbarger, Philip D.; and McCarty, Franklin R., 4,611,680, Cl. 180-69.240.
J. M. Huber Corporation: *See*—
Kostinko, John, 4,612,342, Cl. 524-450.000.
J. T. Baker Chemical Company: *See*—
Kruger, Paul J.; and Schwartzkopf, George, 4,612,034, Cl. 71-80.000.
Jack, James: *See*—
Berner, Godwin; Hoyle, William; and Jack, James, 4,612,049, Cl. 106-14.130.

Jackovitz, John F.; and Peterson, Steven H., to Westinghouse Electric Corp. Process for separation of zirconium isotopes. 4,612,097, Cl. 204-157.200.

Jackson, J. Eric: *See*—
Ferguson, James S.; Jackson, J. Eric; and Brower-Berkhoven, Isaac B., 4,611,551, Cl. 114-339.000.

Jacob, Steven R. Support for goose decoy. 4,611,421, Cl. 43-3.000.

Jacobs Manufacturing Company, The: *See*—
Quenneville, Raymond N.; Mayne, Harry H.; and Sickler, Kenneth H., 4,611,960, Cl. 409-234.000.

Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., to United States of America, Health and Human Services. Biologically-active 1,3-dipropyl-8-phenylxanthine derivatives. 4,612,315, Cl. 514-263.000.

Jacquel, Dominique, to Somfy. Light intensity sensor providing a variable output current. 4,612,438, Cl. 250-206.000.

Jaeger, Carl A.; Berendt, Hans-Ulrich; and Schafer, Paul, to Ciba-Geigy Corporation. Process for dyeing cellulosic textile materials. 4,612,016, Cl. 8-543.000.

Jagenberg Aktiengesellschaft: *See*—
Hildebrandt, Arno, 4,611,518, Cl. 83-105.000.

Jahn, Dieter; Becker, Rainer; Keil, Michael; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Cyclohexane-1,3-dione derivatives and their use for controlling undesirable plant growth. 4,612,036, Cl. 71-91.000.

Jahnke, Bernd, to BBC Aktiengesellschaft Brown, Boveri & Cie. Method for bonding metallic structural elements. 4,611,752, Cl. 228-194.000.

Jakubowski, John A., to Calgon Corporation. Admixtures of 2-bromo-2-bromomethylglutaronitrile and methylene bis(thiocyanate). 4,612,328, Cl. 514-515.000.

James River-Dixie Northern, Inc.: *See*—
Bouchette, Michael P.; Van den Akker, Johannes A.; and Watt, William R., 4,612,231, Cl. 428-167.000.

James River - Norwalk, Inc.: *See*—
Brown, Richard K.; and Seiferth, Oscar E., 4,612,431, Cl. 219-10.55E.

Janisiewicz, Stanley W.; and Lovell, Edward J., to Universal Instruments Corporation. Pick and place method and apparatus for handling electrical components. 4,611,397, Cl. 29-834.000.

Janome Sewing Machine Co., Ltd.: *See*—
Kuramoto, Hidechika, 4,611,547, Cl. 112-254.000.
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,611,940, Cl. 400-649.000.

Jansen, Frank, to Xerox Corporation. Apparatus and process for the fabrication of large area thin film multilayers. 4,612,207, Cl. 427-39.000.

Japan Aviation Electronics Industry Limited: *See*—
Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, 4,611,867, Cl. 339-14.00R.

Jarret, Jacques: *See*—
Jarret, Jean; and Jarret, Jacques, 4,611,792, Cl. 267-149.000.

Jarret, Jean; and Jarret, Jacques, to Societe d'Exploitation des Ressorts Auto-Amortisseurs Jarret. Hydrostatically compressed elastomeric shock absorber spring and method for its manufacture. 4,611,792, Cl. 267-149.000.

Jarvis, Harold F., to Shaw Industries Ltd. Coated pipe having bending capability. 4,611,635, Cl. 138-146.000.

Jasper, Louis J., Jr.; De Santis, Charles M.; and Baxendale, James F., to United States of America, Army. Broadband transverse field interaction continuous beam amplifier. 4,612,476, Cl. 315-3.600.

JBF Scientific Company, Inc.: *See*—
Watkins, Robert L.; and Peters, Kenneth R., 4,611,724, Cl. 220-5.00A.

Jeanson, Rene H.; and Lamothe, Guy. Extensible hitching device for road and rail vehicles. 4,611,821, Cl. 280-482.000.

Jelks, Edward C.; and Melloch, Michael R., to Texas Instruments Incorporated. Photochemical patterning. 4,612,085, Cl. 156-643.000.

Jensen, Hans-Erik K.: *See*—
Jorgensen, Hans; Bertelsen, Iver S.; and Jensen, Hans-Erik K., 4,611,786, Cl. 251-118.000.

Jernigan, Robert T.: *See*—
Pierce, Richard A.; and Jernigan, Robert T., 4,612,134, Cl. 252-75.000.

Jidosha Kiki Co., Ltd.: *See*—
Arino, Masao; and Inoue, Yoshimichi, 4,611,526, Cl. 91-369.00A.

Jochum, Peter, to Hilti Aktiengesellschaft. Explosive powder driven fastening element setting device. 4,611,738, Cl. 227-9.000.

Johansson, Anette M.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

Johnson, Erlon F.: *See*—
Glover, Douglas W.; Hoffer, John C.; Johnson, Erlon F.; and Schaffer, Ronald R., 4,611,887, Cl. 350-96.210.

Johnson, Lawrence N. Boat trailer with pivotal dropped crossbar rolled mounting system. 4,611,948, Cl. 403-232.100.

Johnson, Lester R. Apparatus for transferring semiconductor wafers. 4,611,966, Cl. 414-404.000.

Johnson, Marion: *See*—
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, 4,611,987, Cl. 425-131.100.

Johnson, Marvin M., to Phillips Petroleum Company. Upgrading of spent butane isomerization catalyst to pentane isomerization catalyst. 4,612,293, Cl. 502-28.000.

Johnson, Richard E.: *See*—
Eames, Robert J.; and Johnson, Richard E., 4,611,398, Cl. 29-841.000.

Johnson, Thomas A.; and Hill, Charles A., to Babcock & Wilcox Company, The. Thermally matched coatings for ceramic fiber insulation. 4,612,240, Cl. 428-289.000.

Johnston, James J., to Brand-Rex Company. Electrical outlet box assembly. 4,612,412, Cl. 174-65.00R.

Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, to Lever Brothers Company. Porous polymers. 4,612,334, Cl. 521-146.000.

Jones, Ronald E.: *See*—
Peterson, Royal D.; and Jones, Ronald E., 4,612,648, Cl. 372-109.000.

Jones, Virginia C. Hair shampoo face and body shield. 4,611,354, Cl. 2-174.000.

Joo , Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., to Great Lakes Carbon Corporation. Fuel cell plate separator. 4,611,396, Cl. 29-623.500.

Jorgensen, Hans; Bertelsen, Iver S.; and Jensen, Hans-Erik K., to Danfoss A/S. Radiator valve. 4,611,786, Cl. 251-118.000.

Jorgensen, Ralph H.; and Windle, Patrick J. Wall line insulation pillows. 4,611,443, Cl. 52-95.000.

Joseph, John R.: *See*—
Cho, Frederick Y.; Joseph, John R.; and Seese, Philip A., 4,612,274, Cl. 430-296.000.

Joule' Inc.: *See*—
Clark, Julie L., 4,611,382, Cl. 29-450.000.

Juang, Biing-Hwang, to AT&T Information Systems Inc. Secure voice transmission. 4,612,414, Cl. 179-1.50R.

Jury, Lydia A.: *See*—
Wong, Vincent Y.; Volker, David A.; Jury, Lydia A.; and Bruno, David J., Jr., 4,612,203, Cl. 426-589.000.

K-Sun Company, Inc.: *See*—
King, Charles C., III, 4,611,732, Cl. 222-639.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Fukunaga Takao, 4,611,699, Cl. 192-0.076.

Kabushiki Kaisha Kibun: *See*—
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.

Kabushiki Kaisha Kobe Seikosho: *See*—
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Hara, Hirofumi, 4,611,482, Cl. 72-354.000.

Kabushiki Kaisha Patine Shokai: *See*—
Ohashi, Kazuo, 4,611,471, Cl. 62-235.000.

Kabushiki Kaisha S G: *See*—
Shimizu, Wataru; and Yamashita, Akira, 4,612,503, Cl. 324-208.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Muramatsu, Kenji, 4,612,469, Cl. 310-93.000.

Kabushiki Kaisha Sato: *See*—
Obara, Takeshi; Gotou, Toshirou; and Kobayashi, Kazuyuki, 4,612,232, Cl. 428-172.000.

Kabushiki Kaisha Toshiba: *See*—
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,612,581, Cl. 358-213.000.
Fox, Timothy R., 4,612,596, Cl. 361-146.000.
Kohyama, Mitsuaki; Kasai, Toshihiro; Ishida, Haruhiko; and Osawa, Shigenobu, 4,611,901, Cl. 355-4.000.
Motojima, Hideaki; Takayama, Hiroki; and Ohura, Jun-ichi, 4,612,562, Cl. 357-38.000.
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.
Ogura, Masahiko; and Oushiden, Hideshi, 4,611,909, Cl. 355-56.000.
Suzuki, Fumio; Fujinuma, Makoto; Ohtake, Yasuhisa; and Inaba, Michihiko, 4,612,061, Cl. 148-6.350.
Uchiyama, Susumu, 4,611,494, Cl. 73-626.000.
Yamaura, Mitsuru; and Shuto, Ituo, 4,612,594, Cl. 361-68.000.

Kacalieff, Christ D., to Chris Kaye Plastics Corp. Tamper evident breakaway closure for containers. 4,611,725, Cl. 220-253.000.

Kadin, Joseph, to ITT Corporation. Frequency hopping data communication system. 4,612,652, Cl. 375-1.000.

Kadomatsu, Yuji, to Nippon Kogaku K.K. Electro-optical distance measuring device. 4,611,911, Cl. 356-5.000.

Kagi, Ulrich, to Sulzer Brothers Limited. Method and system of braking and asynchronous motor. 4,612,490, Cl. 318-761.000.

Kai, Osamu: *See*—
Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, 4,612,418, Cl. 179-81.00R.

Kajiki, Minoru: *See*—
Ikemura, Akio; and Kajiki, Minoru, 4,611,653, Cl. 165-54.000.

Kakinuma, Hideo: *See*—
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.

Kakizaki, Katsumi; and Ajiro, Yutaka, to Tomy Kogyo Co. Inc. Remote controlled toy utilizing piezoelectric element. 4,612,472, Cl. 310-339.000.

Kako, Hajime: *See*—
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.

Kako, Masatoshi: *See*—
Hori, Tomoshige; Kako, Masatoshi; and Hiromichi, Hayashi, 4,611,928, Cl. 374-21.000.
Kalanit, Gideon: *See*—
Gargini, Eric J.; and Kalanit, Gideon, 4,612,519, Cl. 333-103.000.
Kallioinen, Jouko O., to Outokumpu Oy. Repeating flotation machine. 4,612,113, Cl. 209-170.000.
Kalve, Ernest. Walking dragline base frame and revolving frame construction. 4,611,440, Cl. 52-65.000.
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, to Toyo Denka Kogyo Co., Ltd.; and Kamatari Co., Ltd. Golf ball. 4,611,810, Cl. 273-218.000.
Kamatari Co., Ltd.: *See*—
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, 4,611,810, Cl. 273-218.000.
Kamiyama, Yoshiyasu; and Nakagome, Keisuke, to Nitto Electric Industrial Co., Ltd. Composite semipermeable membrane of polyamine and trianzine. 4,612,118, Cl. 210-490.000.
Kampe, Wolfgang: *See*—
Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, 4,612,313, Cl. 514-255.000.
Kampf GmbH & Co. Maschinenfabrik, Firma: *See*—
Orbach, Peter, 4,611,769, Cl. 242-56.900.
Kampichler, Gunter; and Rapp, Karl, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,611,566, Cl. 123-506.000.
Kamyr, Inc.: *See*—
Sherman, Michael I.; and Elmore, Carl L., 4,612,286, Cl. 435-157.000.
Kanai, Makoto; Sugita, Hiroshi; and Kawai, Makoto, to Toyoda Gosei Co., Ltd. Steering wheel having boss portion with energy absorbing layer and membrane switch. 4,612,425, Cl. 200-61.550.
Kanao, Shiro. Reinforced underground pipe. 4,611,636, Cl. 138-153.000.
Kanasugi, Mikiko: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.
Kaneda, Koji; and Sugiyama, Masayoshi, to Sony Corporation. Magnetic recording medium. 4,612,244, Cl. 428-323.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Eguchi, Tamiyuki, 4,612,119, Cl. 210-500.230.
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,612,409, Cl. 136-244.000.
Kaneko, Chikara; Sato, Masayuki; and Ogasawara, Hiromichi, to Chisso Corporation. Process for producing 1,3-dioxin-4-one derivatives. 4,612,379, Cl. 549-274.000.
Kaneko, Ichiro: *See*—
Shimizu, Toshihide; Furukawa, Yasuo; and Kaneko, Ichiro, 4,612,354, Cl. 526-62.000.
Kaneko, Masahiko; and Tamada, Hitoshi, to Sony Corporation. Thermomagnetic recording and reproducing system. 4,612,587, Cl. 360-59.000.
Kaneoya, Tatsuo: *See*—
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, 4,612,394, Cl. 564-420.000.
Kanies, David E. Door sealing wedge. 4,611,429, Cl. 49-70.000.
Kanzaki Paper Manufacturing Co. Ltd.: *See*—
Hama, Fumio; Suzuki, Toshitake; and Kondo, Mitsuru, 4,612,557, Cl. 346-216.000.
Kao Corporation: *See*—
Kuroda, Mutsumi; and Murata, Moriyasu, 4,612,137, Cl. 252-174.190.
Kaplan, Martin L.: *See*—
Forrest, Stephen R.; Kaplan, Martin L.; and Schmidt, Paul H., 4,611,385, Cl. 29-574.000.
Kaplan, Richard D., to Standard Oil Company (Indiana). Decoking apparatus. 4,611,613, Cl. 134-95.000.
Kappus, Gunter: *See*—
Brunnee, Curt; Dobberstein, Peter; and Kappus, Gunter, 4,612,440, Cl. 250-281.000.
Karcher, Ralph E., Jr., to Emhart Corporation. Nail detector system. 4,612,538, Cl. 340-679.000.
Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, 4,611,957, Cl. 408-108.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Bergmann, Gerhard, 4,611,475, Cl. 66-207.000.
Brossmer, Maximilian, 4,611,410, Cl. 34-41.000.
Karliner, Rudolf R.; and Peterson, Gerald E., to Wagner Spray Tech Corporation. Pressurized paint pad mounting. 4,611,941, Cl. 401-207.000.
Karmugin, Boris V.: *See*—
Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., 4,611,625, Cl. 137-505.250.
Karp, Edward C., to Sanitary Scale Company. Automated one-stroke label applicator. 4,612,078, Cl. 156-493.000.
Karr, Michael A., III: *See*—
Cline, Terry W.; Karr, Michael A., III; and Levinson, Frank H., 4,611,886, Cl. 350-96.200.
Kasai, Kiyoshi; Tsukidate, Takaaki; Nagata, Shinji; and Arakawa, Toshihiko, to Toya Soda Manufacturing Co., Ltd. Process for preparation of silicon nitride powder of good sintering property. 4,612,297, Cl. 501-97.000.
Kasai, Toshihiro: *See*—
Kohyama, Mitsuaki; Kasai, Toshihiro; Ishida, Haruhiko; and Osawa, Shigenobu, 4,611,901, Cl. 355-4.000.
Kasamura, Toshirou; and Sasaki, Nobukazu, to Canon Kabushiki Kaisha. Developing apparatus. 4,611,899, Cl. 355-3.0DD.
Kaschube, Karl-Friedrich: *See*—
Brandenstein, Manfred; Edelmann, Ludwig; and Kaschube, Karl-Friedrich, 4,611,931, Cl. 384-477.000.
Kasper, Rolf; and Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Pressure equalizing pad for heated plate presses. 4,612,081, Cl. 156-583.100.
Katashima, Tadashi; and Iwaki, Yoshiyuki, to Mitsubishi Denki Kabushik Kaisha. Control device for charging generator. 4,612,493, Cl. 320-64.000.
Kato, Hideo: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.
Kato, Hiroyasu; and Yagi, Kenkichi, to Toray Industries, Inc. Ultrafine fiber entangled sheet. 4,612,228, Cl. 428-151.000.
Kato, Mitsuo: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.
Kato, Yoshito; Sunahara, Shuichi; Tanaka, Takayuki; and Takahashi, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Automatic painting system. 4,611,695, Cl. 118-323.000.
Kato, Yuuichi; Ugajin, Mitsuyuki; and Kawakita, Tatsuya, to Toyota Jidosha Kabushi Kaisha. Exhaust gas by-pass system in a turbocharger for an internal combustion engine. 4,611,465, Cl. 60-602.000.
Katoh, Toshio: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; and Yamaguchi, Akihiro, 4,612,388, Cl. 562-443.000.
Katsuyama, Toshio; Satoh, Shin; and Matsumura, Hiroyoshi, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Glass material for optical fibers used in infrared region. 4,612,294, Cl. 501-40.000.
Kautzky, Hans. Central occluder semi-biological heart valve. 4,612,011, Cl. 623-2.000.
Kawabata, Kazuhisa; Kumabe, Hirohide; and Kawai, Shunzo, to Daiawa Kobunshi Kogyo Co., Ltd. Method for production of waterproofing sheet. 4,612,152, Cl. 264-136.000.
Kawabata, Yoshichika: *See*—
Tsuji, Shuya; Kawabata, Yoshichika; and Yamamoto, Rokuro, 4,611,980, Cl. 425-435.000.
Kawaguchi, Masao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,611,562, Cl. 123-440.000.
Kawahara, Hisashi, to Citizen Watch Co., Ltd. Electronic timepiece with a depth gauge. 4,611,923, Cl. 368-10.000.
Kawai, Makoto: *See*—
Kanai, Makoto; Sugita, Hiroshi; and Kawai, Makoto, 4,612,425, Cl. 200-61.550.
Kawai, Shunzo: *See*—
Kawabata, Kazuhisa; Kumabe, Hirohide; and Kawai, Shunzo, 4,612,152, Cl. 264-136.000.
Kawakita, Tatsuya: *See*—
Kato, Yuuichi; Ugajin, Mitsuyuki; and Kawakita, Tatsuya, 4,611,465, Cl. 60-602.000.
Kawamori, Yoshihiro: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.
Kawamoto, Hiroshi: *See*—
Okamura, Hisashi; and Kawamoto, Hiroshi, 4,612,280, Cl. 430-621.000.
Kawamura, Toshimi, to Mitsubishi Denki Kabushiki Kaisha. Flywheel energy storage system. 4,612,494, Cl. 322-4.000.
Kawano, Saige, to Mazda Motor Corporation. Method of and system for assembling a plurality of parts into a unit. 4,611,749, Cl. 228-176.000.
Kawasaki, Masahiko: *See*—
Abe, Kazuyoshi; Kawasaki, Masahiko; Yazaki, Kazuhiko; and Sekine, Yoshitada, 4,611,380, Cl. 29-430.000.
Kawasaki, Youichi; and Igarashi, Kenji, to Nippon Unicar Co. Limited. Semi-conductive polyolefin compositions and cables covered with same. 4,612,139, Cl. 252-511.000.
Kawashima, Hiroshi; Mogami, Takao; and Kubota, Satoshi, to Seiko Epson Corporation. Synthetic resin ophthalmic lens having a surface hard coat. 4,611,892, Cl. 351-159.000.
Kaya, Azmi; and Keyes, Marion A., IV, to Babcock & Wilcox Company, The. Distributed system for optimizing the performance of a plurality of multi-stage steam turbines using function blocks. 4,612,621, Cl. 364-494.000.
Kayakabe, Nobuhiro; and Sasaki, Isamu, to Aisin Seiki Kabushiki Kaisha. Clutch cover. 4,611,702, Cl. 192-110.00R.
Kazi, Shaukat: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,611,632, Cl. 137-625.650.
Keahey, Sammie G.: *See*—
Feiber, Wolfgang E. A.; Keahey, Sammie G.; and Kunkle, James R., 4,611,846, Cl. 294-88.000.
Keedy, Edgar L., to Victor, Remi L.; and Victor, Mary H. Vehicle power system comprising an auxiliary engine in combination with the main vehicle engine. 4,611,466, Cl. 60-714.000.
Keen, Ronald T., to RCA Corporation. Video signal processor with selective clamp. 4,612,577, Cl. 358-172.000.
Keeney, Stanley C.: *See*—
Andresen, Bernhard H.; and Keeney, Stanley C., 4,612,499, Cl. 324-73.00R.

Keil, Michael: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; and Wuerzer, Bruno, 4,612,036, Cl. 71-91.000.

Keiper Recaro GmbH & Co.: *See*—
Lehmann, Gerhard; and Wagener, Heinz-Jurgen, 4,611,853, Cl. 297-379.000.
Werner, Heinz; Kluting, Bernd A.; Bertram, Klaus D.; and Svoboda, Frantisek, 4,611,778, Cl. 248-429.000.

Keiser, Bruce A., to Nalco Chemical Company. Stable acidic and alkaline metal oxide sols. 4,612,138, Cl. 252-313.200.

Keith, Harvey D.; von Seggern, Heinz; Wang, Tsuey T.; and West, James E., to AT&T Bell Laboratories. Method for producing electret-containing devices. 4,612,145, Cl. 264-22.000.

Kelly, John H.; and Guest, Leonard E., to Stelco Inc. Method for automatically fluxing and casting samples. 4,612,042, Cl. 75-24.000.

Kelso, Jimmie J.; and Hustead, Russell M. Calibrated examining glove. 4,611,603, Cl. 128-775.000.

Kendall, Clarence E., Jr.; and Moore, Boyd B. Protective jacket assembly. 4,611,656, Cl. 166-65.100.

Kendall, Harry A.: *See*—
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,611,787, Cl. 254-267.000.

Kennecott Corporation: *See*—
Ten Eyck, John D., 4,612,087, Cl. 162-129.000.

Kennette, John W.; Buyofsky, Conrad C.; and Bassett, Alton H., to Chicopee. Fabric having excellent wiping properties. 4,612,226, Cl. 428-134.000.

Kenobel AB: *See*—
Swiatkowski, Piotr, 4,612,112, Cl. 209-166.000.

Keogh, Philip L.: *See*—
Steklenski, David J.; and Keogh, Philip L., 4,612,279, Cl. 430-523.000.

Kerivan, Leo J.: *See*—
Hubbard, John D.; and Kerivan, Leo J., 4,611,737, Cl. 226-74.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Uhlemann, Reinhard; and Oster, Walter, 4,612,488, Cl. 318-582.000.

Kersting, Erik. Horizontally extending curing devices. 4,611,989, Cl. 432-121.000.

Kessler, Horst: *See*—
Szabo, Sandor; Usadel, Klaus W.; and Kessler, Horst, 4,612,302, Cl. 514-11.000.

Keyes, Marion A., IV: *See*—
Kaya, Azmi; and Keyes, Marion A., IV, 4,612,621, Cl. 364-494.000.

Khan, Riaz A.; Mufti, Khisar S.; and Patel, Gita D., to Tate & Lyle Public Limited Co. Trichloro, 6-substituted sucrose compounds, compositions and uses therefor. 4,612,373, Cl. 536-120.000.

Khelghatian, Habet M.: *See*—
Arzoumanidis, Gregory G.; Khelghatian, Habet M.; and Lee, Sam S., 4,612,299, Cl. 502-104.000.

Kida, Shiro: *See*—
Ogata, Masaru; Matsumoto, Hiroshi; Kida, Shiro; and Tawara, Katsuya, 4,612,322, Cl. 514-383.000.

Kiehs, Karl: *See*—
Burstinghaus, Rainer; Henkes, Erhard; Kiehs, Karl; and Adolphi, Heinrich, 4,612,306, Cl. 514-112.000.

Kiersarsky, Albert; Sauer, Earl S.; Vesperman, William; and Wilson, Max K., to AT&T Technologies, Inc. Plastic-coated metallic members. 4,612,233, Cl. 428-206.000.

Kiesewetter, Willi: *See*—
Alt, Christian; Kober, Arthur; and Kiesewetter, Willi, 4,612,126, Cl. 210-787.000.

Kiesow, Carl, to Carl Kiesow Rohstoffruckewinnung. Method and apparatus for separating different constituents. 4,612,114, Cl. 209-172.000.

Kikkawa, Katsumasa: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.

Kikuchi, Kazuo, to Alps Electric Co., Ltd. Interface circuit. 4,612,463, Cl. 307-490.000.

Kim, Tai K.; McClintic, Robert P.; and Vanderpool, Clarence D., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,612,180, Cl. 423-593.000.

Kim, Tai K.; MacInnis, Martin B.; and McClintic, Robert P., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,612,182, Cl. 423-593.000.

Kim, Tai K.; Boyer, Carl W.; MacInnis, Martin B.; and Ennis, Donald H., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,612,183, Cl. 423-593.000.

Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, to Hitachi, Ltd. Parallel-connected gate turn-off thyristors. 4,612,561, Cl. 357-38.000.

Kinbara, Masaaki: *See*—
Miyakawa, Shinpei; and Kinbara, Masaaki, 4,611,621, Cl. 137-115.000.

King, Charles C., III, to K-Sun Company, Inc. Apparatus for dispensing liquid. 4,611,732, Cl. 222-639.000.

King, Francis C.: *See*—
Agee, John M.; and King, Francis C., 4,611,586, Cl. 128-92.00A.

King, Francis D., to Beecham Group p.l.c. Bridged quinolizidinylbenzamides, compositions containing them and methods for their use. 4,612,319, Cl. 514-305.000.

King Tsushin Kogyo Kabushiki Kaisha: *See*—
Toshimichi, Yasujima, 4,612,442, Cl. 250-353.000.

King, William J., to United States of America, Navy. Automatic pattern recognition apparatus. 4,612,666, Cl. 382-32.000.

Kinney, Thomas B.: *See*—
Fogarty, Thomas J.; Finn, James C., III; Kinney, Thomas B.; and Hermann, George D., 4,611,593, Cl. 128-325.000.

Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Method for controlling signal integration time of a signal integration type image sensing device. 4,612,454, Cl. 307-311.000.

Kioritz Corporation: *See*—
Kondo, Tadashige; and Ohno, Susumu, 4,611,569, Cl. 123-600.000.

Kirk, Kenneth L.: *See*—
Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., 4,612,315, Cl. 514-263.000.

Kirkpatrick, George F.: *See*—
Biel, Edward N.; and Kirkpatrick, George F., 4,612,221, Cl. 428-35.000.

Kish, Arthur S., to Murray Corporation. Method of assembling an accumulator dehydrator. 4,611,750, Cl. 228-184.000.

Kishimoto, Toshinobu: *See*—
Yamauchi, Takao; Suzuki, Hayato; Iwabuchi, Osamu; and Kishimoto, Toshinobu, 4,612,495, Cl. 322-100.000.

Kisida, Hirosi; and Yano, Toshihiko, to Sumitomo Chemical Company, Limited. Insecticidal and acaricidal derivatives of 1-benzylbenzimidazole. 4,612,323, Cl. 514-394.000.

Kissel, William R., to Chrysler Corporation. Diagnostic protection circuit and method using tri-state control and positive feedback. 4,612,638, Cl. 371-15.000.

Kitagawa Industries Co., Ltd.: *See*—
Matsui, Kazuhiro; Wada, Hideo; Nakano, Yoshihito; and Hayashi, Toshihiro, 4,611,868, Cl. 339-59.00M.

Kitajima, Masao: *See*—
Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,612,290, Cl. 436-97.000.

Kitasato Institute: *See*—
Umezawa, Iwao; and Komiyama, Kanki, 4,612,285, Cl. 435-128.000.

Kittaka, Toshiharu: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Kleefstra, Marcus; Montagne, Antonius J. M.; and Pathuis, Jan W., to U.S. Philips Corporation. Charge-coupled transversal filter. 4,612,521, Cl. 333-165.000.

Klein, Howard P.: *See*—
Cuscurida, Michael; and Klein, Howard P., 4,612,335, Cl. 521-167.000.

Klieman, Charles H.; and Densmore, Richard M., to Klieman, Charles H.; and Covell, L. David. Spring activated hemostatic clip applicator. 4,611,595, Cl. 128-334.00R.

Klingensmith, James D.: *See*—
Hovland, Lyle W.; and Klingensmith, James D., 4,612,552, Cl. 343-880.000.

Klubitschko, Gerd: *See*—
Knabel, Walter; and Klubitschko, Gerd, 4,611,497, Cl. 73-862.680.

Kluting, Bernd A.: *See*—
Werner, Heinz; Kluting, Bernd A.; Bertram, Klaus D.; and Svoboda, Frantisek, 4,611,778, Cl. 248-429.000.

KMS Fusion, Inc.: *See*—
Musinski, Donald L., 4,611,474, Cl. 62-514.00R.

Knabel, Walter; and Klubitschko, Gerd, to Marker International. Force transducer. 4,611,497, Cl. 73-862.680.

Knecht, Adolf, to Warner-Lambert Company. Antirheumatically active suppositories. 4,612,310, Cl. 514-222.000.

Kneisel, Dietmar, to Brown, Boveri & Cie AG. Circuit arrangement for the radio interference suppression in brightness control devices using the phase gating principle. 4,612,480, Cl. 315-224.000.

Knott, David M.: *See*—
Blair, Kelvin R.; Furman, Lynn C.; and Knott, David M., 4,611,389, Cl. 29-589.000.

Kobayashi, Hideo: *See*—
Ohkawa, Michihisa; and Kobayashi, Hideo, 4,612,515, Cl. 331-1.00A.

Kobayashi, Kazuyuki: *See*—
Obara, Takeshi; Gotou, Toshirou; and Kobayashi, Kazuyuki, 4,612,232, Cl. 428-172.000.

Kobayashi, Tadakazu: *See*—
Hitotsuyanagi, Hajime; Igarashi, Tadashi; Ishii, Masayuki; and Kobayashi, Tadakazu, 4,612,559, Cl. 357-2.000.

Kobayashi, Yoshiaki; and Yoshida, Hiroshi, to Clarion Co., Ltd. Speaker system. 4,611,686, Cl. 181-156.000.

Kober, Arthur: *See*—
Alt, Christian; Kober, Arthur; and Kiesewetter, Willi, 4,612,126, Cl. 210-787.000.

Kobras, Franz: *See*—
Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, 4,611,843, Cl. 294-86.400.

Koch, Daniel: *See*—
Meister, Pierre-Andre ; and Koch, Daniel, 4,611,927, Cl. 368-188.000.

Kocher, Erich J., to Vilter Manufacturing Corporation. Means for removing bearing from crankshaft. 4,611,503, Cl. 74-603.000.

Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, to Niigata Engineering Co., Ltd. Rotation control system for Z-type propulsion apparatus. 4,611,549, Cl. 114-144.00E.

Kohashi, Toru: *See*—
Adachi, Motoyuki; and Kohashi, Toru, 4,611,674, Cl. 177-1.000.
Kohlbecker, Jorg: *See*—
Gosch, Hans-Werner; Franke, Karl; Kohlbecker, Jorg; and Dormichian, Bahram, 4,612,173, Cl. 423-170.000.
Kohler, Franz, to Contraves GmbH. Method for operational status checks of an ink jet printer. 4,612,553, Cl. 346-1.100.
Kohler, Gerd: *See*—
Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, 4,611,843, Cl. 294-86.400.
Kohn, Erhard: *See*—
Dortu, Jean-Marc; and Kohn, Erhard, 4,612,560, Cl. 357-22.000.
Kohyama, Mitsuaki; Kasai, Toshihiro; Ishida, Haruhiko; and Osawa, Shigenobu, to Kabushiki Kaisha Toshiba. Electrophotographic method and apparatus. 4,611,901, Cl. 355-4.000.
Koizumi, Masaaki; Fukada, Nobuo; and Okano, Hiroyuki, to Toho Titanium Co., Ltd. Consumable electrode for production of Nb-Ti alloys. 4,612,040, Cl. 75-10.650.
Kojima, Ryuiji; Suzuki, Naomi; Sato, Yokichi; and Saito, Tsuneo, to Parker Chemical Company. Process for controlling zinc phosphate treating solutions. 4,612,060, Cl. 148-6.15Z.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Ohkawa, Michihisa; and Kobayashi, Hideo, 4,612,515, Cl. 331-1.00A.
Tanaka, Shinsuke; and Imamura, Nobutake, 4,612,068, Cl. 148-301.000.
Kolchinsky, Abel E.; and Kazi, Shaukat, to Imperial Clevite Inc. Hydraulic solenoid valve structure. 4,611,632, Cl. 137-625.650.
Koller, Thomas J.: *See*—
Ireland, Thomas M.; Koller, Thomas J.; and Lancaster, Michael T., 4,611,777, Cl. 248-371.000.
Koller, Wolfgang; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of pure 2-ethylamino-4-nitro-1-alkoxybenzenes. 4,612,396, Cl. 564-441.000.
Komachi, Taichi, to Tokyo Keiki Co., Ltd. Ultrasonic flow meter. 4,611,496, Cl. 73-861.270.
Komatsu, Kenichi; and Honda, Michitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray television diagnostic apparatus. 4,612,572, Cl. 358-111.000.
Komatsu, Takashi; and Ishino, Yasuo, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 4,611,365, Cl. 15-339.000.
Komatsubara, Michimasa: *See*—
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, 4,612,627, Cl. 364-736.000.
Komatsuzaki, Shigeki: *See*—
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, 4,612,127, Cl. 252-32.500.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,612,128, Cl. 252-32.500.
Komiyama, Kanki: *See*—
Umezawa, Iwao; and Komiyama, Kanki, 4,612,285, Cl. 435-128.000.
Kondo, Asaji: *See*—
Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,612,290, Cl. 436-97.000.
Kondo, Mitsuru: *See*—
Hama, Fumio; Suzuki, Toshitake; and Kondo, Mitsuru, 4,612,557, Cl. 346-216.000.
Kondo, Tadashige; and Ohno, Susumu, to Kioritz Corporation. Ignition system. 4,611,569, Cl. 123-600.000.
Kondo, Yoshihiko: *See*—
Matukuma, Akira; Takahashi, Yohji; and Kondo, Yoshihiko, 4,612,327, Cl. 514-479.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.
Tsuboi, Norio; Furukawa, Noboru; and Miyazawa, Sadayuki, 4,612,018, Cl. 55-15.000.
Koosmann, Mark R., to Rosemount Inc. Membrane type non-intrusive ice detector. 4,611,492, Cl. 73-579.000.
Koppelomaki, Leo. Boarding steps. 4,611,552, Cl. 114-343.000.
Koresh, Peretz, to Dan Mamtirim. Rotary irrigation spray device. 4,611,760, Cl. 239-233.000.
Koshinaka, Eiichi: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.
Kostinko, John, to J. M. Huber Corporation. Rubber compositions containing small particle size zeolites. 4,612,342, Cl. 524-450.000.
Kosugi, Seiji; and Takata, Hideyuki, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Solenoid operated poppet type change-over valve. 4,611,631, Cl. 137-625.650.
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, to Sumitomo Chemical Company, Limited. Process for producing aminophenyl-β-hydroxyethylsulfone. 4,612,394, Cl. 564-420.000.
Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method for fabricating bevel and hypoid gear pairs. 4,611,956, Cl. 409-26.000.
Kowalzik, Siegfried: *See*—
Schlinsog, Hans-Jurgen; and Kowalzik, Siegfried, 4,612,107, Cl. 204-300.0EC.
Kowata, Masakatsu; and Hiyama, Torao, to Alps Electric Co., Ltd. Microwave transistor mounting structure. 4,612,566, Cl. 357-80.000.
Kowger, Dorothy J., executrix: *See*—
Hawrylo, Frank Z.; and Kowger, Henry V., deceased, 4,612,211, Cl. 427-86.000.
Kowger, Henry V., deceased: *See*—
Hawrylo, Frank Z.; and Kowger, Henry V., deceased, 4,612,211, Cl. 427-86.000.
Kramer, Daniel P.; and Massey, Richard T., to United States of America, Energy. Method and apparatus for performing in-situ vacuum-assisted metal to glass sealing. 4,612,029, Cl. 65-59.240.
Kramer, Hans: *See*—
Britzke, Ingo; and Kramer, Hans, 4,611,434, Cl. 49-257.000.
Kraus, Richard B.; and Musschoot, Albert, to General Kinematics. Vibratory conveyor. 4,611,709, Cl. 198-764.000.
Kraus, Werner. Implantable device for the stimulation of bone growth. 4,611,597, Cl. 128-419.00F.
Krechel, Oliver A., to Profile Systems, Inc. Curtain wall and window frame construction. 4,611,447, Cl. 52-209.000.
Krenn, Manfred; Raffer, Gerhard; Wagendristel, Alfred; and Bangert, Herwig, to Anton Paar, KG; Bangert, Herwig; and Wagendristel, Alfred. Micro hardness testing device. 4,611,487, Cl. 73-81.000.
Kress, Dieter; and Haberle, Friedrich, to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Reamer with radially adjustable tool bit position. 4,611,959, Cl. 408-180.000.
Kretchmer, Richard A.; and Hinrichs, Lansing M., to Standard Oil Company (Indiana). Removal of sulfur oxides and particulates with copper-containing absorbers. 4,612,177, Cl. 423-244.000.
Kretchmer, Richard A.: *See*—
Connolly, John F.; Thrash, Robert J.; and Kretchmer, Richard A., 4,612,265, Cl. 429-196.000.
Kreutzer, Karl; and Simmat, Fritz, to Heraeus Quarzschmelze GmbH. Method of manufacturing stria-free, bubble-free and homogeneous quartz-glass plates. 4,612,023, Cl. 65-32.000.
Kriebel, Manfred: *See*—
Fischer, Herbert; and Kriebel, Manfred, 4,612,020, Cl. 55-40.000.
Krohn, Ernst-Otto: *See*—
Pohl, Wulf-Dieter; and Krohn, Ernst-Otto, 4,611,616, Cl. 137-15.100.
Kromer, Heiner M.; and November, Daniel. Cooling system for a slab gel electrophoresis apparatus. 4,612,106, Cl. 204-299.00R.
Krone GmbH: *See*—
Gerke, Dieter; Forberg, Horst; and Radelow, Wolfgang, 4,611,874, Cl. 339-97.00R.
Kruckewitt, Wilfried; and Plettner, Horst, to Brown, Boveri & Cie AG. High pressure accumulator. 4,611,634, Cl. 138-31.000.
Krude, Werner; and Hazebrook, Daniel W., to GKN Automotive Components Inc. Independent wheel suspension system using thrust bearing constant velocity universal drive joints as suspension members. 4,611,681, Cl. 180-73.400.
Kruger, Paul J.; and Schwartzkopf, George, to J. T. Baker Chemical Company. Herbicidal formulation. 4,612,034, Cl. 71-80.000.
Kruger, Robert J.: *See*—
Beebe, Susan M.; Dennehey, T. Michael; Kruger, Robert J.; and Zdeb, Brian D., 4,611,643, Cl. 141-311.00R.
Krumenacker, Leon: *See*—
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,612,401, Cl. 568-362.000.
Krupp Koppers GmbH: *See*—
Gosch, Hans-Werner; Franke, Karl; Kohlbecker, Jorg; and Dormichian, Bahram, 4,612,173, Cl. 423-170.000.
Kubo, Katsuro: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Kubota, Satoshi: *See*—
Kawashima, Hiroshi; Mogami, Takao; and Kubota, Satoshi, 4,611,892, Cl. 351-159.000.
Kubota, Toshimichi: *See*—
Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, 4,612,418, Cl. 179-81.00R.
Kucharczyk, Eckhard, to Siegenia-Frank, KG. Ventilation appliance. 4,611,531, Cl. 98-39.100.
Kudlicka, Mark L.; and Cranston, Albert E., III, to Cranston Machinery Co., Inc. Bale strapping apparatus. 4,611,534, Cl. 100-26.000.
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Neuenschwander, Kent W., to William H. Rorer, Inc. Antisecretory bicyclic benzo-oxy heterocyclic ethers and thioethers. 4,612,309, Cl. 514-212.000.
Kuhn, Friedhelm, to Ruhrgas Aktiengesellschaft. Method for the heat treatment of workpieces. 4,612,065, Cl. 148-16.000.
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,612,110, Cl. 208-251.00H.
Kullberg, Wilhelm. Closure on a rectangular container for storing of liquid. 4,611,753, Cl. 229-17.00R.
Kumabe, Hirohide: *See*—
Kawabata, Kazuhisa; Kumabe, Hirohide; and Kawai, Shunzo, 4,612,152, Cl. 264-136.000.
Kumagai, Atsushi; Tanabe, Tsutomu; and Yasunaga, Hirokazu, to Nippon Piston Ring Co., Ltd. Piston ring member. 4,612,260, Cl. 428-667.000.
Kunick, Klaus: *See*—
Hortmann, Guenter; and Kunick, Klaus, 4,611,598, Cl. 128-419.00R.

Kunkle, James R.: *See*—
Feiber, Wolfgang E. A.; Keahey, Sammie G.; and Kunkle, James R., 4,611,846, Cl. 294-88.000.

Kunreuther, Steven J. Universal needle assembly for fastener attachers. 4,611,740, Cl. 227-67.000.

Kupfermuhle Holztechnik GmbH: *See*—
Wassmer, Paul; and Schake, Fritz, 4,611,646, Cl. 144-117.00R.

Kupper, Philip L.; and Shields, Marsha W., to Procter & Gamble Company. Carbonated juice beverage with cola taste. 4,612,205, Cl. 426-599.000.

Kurahashi, Kazuo: *See*—
Fujino, Yoshihiro; and Kurahashi, Kazuo, 4,611,371, Cl. 29-20.000.

Kuramoto, Hidechika, to Janome Sewing Machine Co., Ltd. Upper thread tension device of a sewing machine. 4,611,547, Cl. 112-254.000.

Kuraray Company, Limited: *See*—
Genba, Tsuneo; Mizobe, Akio; Okazaki, Masaki; and Sakuragi, Isao, 4,612,157, Cl. 264-185.000.
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,612,384, Cl. 558-198.000.

Kurata, Sakae: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.

Kurfman, Virgil B., to Dow Chemical Company, The. Method for making duplex metal alloy/polymer composites. 4,612,216, Cl. 427-250.000.

Kuriyama, Takashi: *See*—
Nakagaki, Shintaro; and Kuriyama, Takashi, 4,612,570, Cl. 358-36.000.

Kuroda, Mutsumi; and Murata, Moriyasu, to Kao Corporation. Anti-yellowing detergent composition containing citrate and isocitrate. 4,612,137, Cl. 252-174.190.

Kurosawa, Tsutomu, to Asahi Electronics Co., Ltd. Tape drive device for telephone answering device. 4,612,590, Cl. 360-91.000.

Kuroyanagi, Tomomitsu: *See*—
Takase, Osamu; and Kuroyanagi, Tomomitsu, 4,612,585, Cl. 358-316.000.

Kurozu, Shinichi: *See*—
Matsuoka, Toshio; and Kurozu, Shinichi, 4,612,041, Cl. 75-10.140.

Kurth, Hermann; and Robitschko, Peter, to Daimler-Benz Aktiengesellschaft. Motor vehicle alarm system with acoustic signal emission via at least one radio loudspeaker installed into the motor vehicle. 4,612,530, Cl. 340-63.000.

Kutscher, Horst; and Zahs, Gernot, to VACMETAL Gesellschaft fur Vakuum-Metallurgie mbH. Method of vacuum treating metal melts, and vessel for use in the method. 4,612,044, Cl. 75-49.000.

Kuwajima, Takeshi; and Amazawa, Kiyoshi, to NEC Corporation and Clarion Co., Ltd. Control circuit. 4,612,662, Cl. 381-10.000.

Kuwayama, Kiyoaki: *See*—
Nishiyama, Kazuo; Mishima, Yasuhiro; and Kuwayama, Kiyoaki, 4,611,793, Cl. 267-52.000.

Kyoto Measuring Instruments Corp.: *See*—
Yamamoto, Nobuyuki; and Nakai, Tatsuaki, 4,611,402, Cl. 33-139.000.

L. S. Starrett Company, The: *See*—
Plante, Robert A., 4,611,408, Cl. 33-552.000.

La Telemecanique Electrique: *See*—
Barrabes, Claude, 4,611,876, Cl. 339-263.00R.

La Barge, Robert L.; and Ewing, Ronald J., to Aluminum Company of America. Method of joining two or more pieces of malleable material. 4,611,381, Cl. 29-432.000.

Label-Aire, Inc.: *See*—
Ostrow, Robert L., 4,612,079, Cl. 156-497.000.

Lade, Robert W.: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,612,465, Cl. 307-584.000.

Lai, Yu-Chin; DeBona, Bruce T.; and Prevorsek, Dusan C., to Allied Corporation. Thermotropic polyester-carbonates containing 2,2-dimethyl-1,3-propanediol. 4,612,362, Cl. 528-190.000.

Laine, Richard M.; and Blum, Yigal, to S R I International. Method of producing polysilazanes. 4,612,383, Cl. 556-412.000.

Lalancette, Jean-Marc; and Menard, Hugues, to Ceram-Sna Inc. Degradation of polycyclic aromatic hydrocarbons adsorbed over chrysotile asbestos. 4,612,178, Cl. 423-338.000.

Lall, Chaman: *See*—
German, Randall M.; Lall, Chaman; and Madan, Deepak S., 4,612,048, Cl. 75-246.000.

Lam, Ken; Pond, John H.; and Wilda, Douglas W., to Honeywell Inc. Pressure sensor header. 4,612,227, Cl. 428-137.000.

Lambla, Morand: *See*—
Nicco, Adrien; Hubert, Jerome; Druz, Jacques; and Lambla, Morand, 4,612,349, Cl. 525-117.000.

Lamothe, Guy: *See*—
Jeanson, Rene H.; and Lamothe, Guy, 4,611,821, Cl. 280-482.000.

Lancaster Colony Corporation: *See*—
Staab, Robert J., 4,611,720, Cl. 211-60.100.

Lancaster, Michael T.: *See*—
Ireland, Thomas M.; Koller, Thomas J.; and Lancaster, Michael T., 4,611,777, Cl. 248-371.000.

Landrau, Felix A.: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,612,186, Cl. 424-15.000.

Landry, James F.; Croudace, Michael C.; On, Harry P., Jr.; and Shen, Sidney Y., to Union Oil Company of California. Organometallic compositions useful as lubricating oil additives. 4,612,130, Cl. 252-39.000.

Langhorst, Marsha L., to Dow Chemical Company, The. Method and device for separating water vapor from air. 4,612,019, Cl. 55-16.000.

Langon, Bernard, to Aluminium Pechiney. Carbonaceous anode with partially constricted round bars intended for cells for the production of aluminium by electrolysis. 4,612,105, Cl. 204-286.000.

Lannen Tehtaat Oy: *See*—
Hakli, Marja H., 4,611,428, Cl. 47-86.000.

Laplace, Carl J., Jr.; and Williams, Conrad F., to Siemens-Allis, Inc. Method and apparatus for monitoring instantaneous electrical parameters of a power distribution system. 4,612,617, Cl. 364-483.000.

Laptewicz, Joseph E., Jr.; and Bauer, Roland, to Pfizer Hospital Products Group, Inc. Laser beam resistant material. 4,611,588, Cl. 128-132.00R.

Lares, Joseph P.; and Cowell, Mark, to Lares Research. Dental handpiece construction. 4,611,990, Cl. 433-129.000.

Lares Research: *See*—
Lares, Joseph P.; and Cowell, Mark, 4,611,990, Cl. 433-129.000.

Lariviere, John: *See*—
Brimo, Rene J.; Lariviere, John; and Riedl, James, 4,612,102, Cl. 204-228.000.

Larson, Hugo R.; and Subramanyam, Dilip K., to Abex Corporation. Manganese steel. 4,612,067, Cl. 148-329.000.

Larson, Robert W. Manual and automatic tracer lathe. 4,611,644, Cl. 142-7.000.

Larson, Wallace H., to Western Gear Corporation. Lockbody mechanism. 4,611,944, Cl. 403-60.000.

Lau, Philip; and Tang, Ping W., to Eastman Kodak Company. Photographic materials and process comprising polymeric couplers with alkoxyalkylacrylate comonomers. 4,612,278, Cl. 430-381.000.

Launder, Richard L. Locking mechanism for earth excavation teeth. 4,611,418, Cl. 37-141.00T.

Lauro, Charles W., to Gerber Products Company. Passageway closure of adjustable width. 4,611,431, Cl. 49-55.000.

Lautenschlager, Karl, to Karl Lautenschlager KG Mobelbeschlagfabrik. Drilling and boring fixture for furniture hardware parts. 4,611,957, Cl. 408-108.000.

Lavanish, Jerome M.: *See*—
Van Gemert, Barry; Lavanish, Jerome M.; and Schwindeman, James A., 4,612,038, Cl. 71-92.000.

LaVergne, Debra B.: *See*—
Hofer, Donald C.; LaVergne, Debra B.; Twieg, Robert J.; and Volksen, Willi, 4,612,210, Cl. 427-82.000.

Lawton, Rodney J., to Plessey Overseas Limited. FM demodulator using combined outputs of plural FM detectors. 4,612,510, Cl. 329-107.000.

Lee, John Y., to Ethyl Corporation. Alkyl mercaptan process. 4,612,398, Cl. 568-73.000.

Lee, Sam S.: *See*—
Arzoumanidis, Gregory G.; Khelghatian, Habet M.; and Lee, Sam S., 4,612,299, Cl. 502-104.000.

Leemans, Daniel L.: *See*—
Hall, James W.; Popelier, Maurice A.; and Leemans, Daniel L., 4,611,605, Cl. 130-23.000.

Leete, Tom G., to Honeywell Inc. Sequential data transmission system. 4,612,635, Cl. 370-89.000.

Lefebvre, Martin C.: *See*—
Grover, Wayne D.; and Lefebvre, Martin C., 4,612,636, Cl. 370-94.000.

Legros, Raymond D.: *See*—
Fraser, Michael J.; and Legros, Raymond D., 4,611,744, Cl. 228-119.000.

Lehmann, Gerhard; and Wagener, Heinz-Jurgen, to Keiper Recaro GmbH & Co. Articulated fitting for vehicle seats. 4,611,853, Cl. 297-379.000.

Lehmann, Ulrich, to Dr.Ing. h.c.F. Porsche Aktiengesellschaft. Switch mechanism for sequential action of a double clutch mechanism. 4,611,698, Cl. 192-30.00W.

Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, to Boehringer Mannheim GmbH. Pharmaceutical phenylacetonitrile derivatives. 4,612,313, Cl. 514-255.000.

Le Marchant, Pierre: *See*—
Robert, Serge; Cahart, Olivier F.; and Le Marchant, Pierre, 4,612,413, Cl. 178-22.080.

Lemone, Louis A.: *See*—
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.

Lenke, Dieter: *See*—
Franke, Albrecht; Gries, Josef; Mueller, Claus D.; and Lenke, Dieter, 4,612,320, Cl. 514-317.000.

Lenze, Friedrich: *See*—
Heilmann, Wolfgang; Lenze, Friedrich; Missaire, Gerhard; and Winter, Friedrich, 4,611,838, Cl. 285-331.000.

Leonard, Gustav, Jr. Adjustable object hanger. 4,611,779, Cl. 248-476.000.

Lescaut, Pierre L., to Atochem. Pipe joints and process for their production. 4,611,833, Cl. 285-55.000.

Leslie, Bruce E., to Thaxton, Inc. High pressure pipe stopper. 4,611,485, Cl. 73-49.800.

Lesperance, Delos P.: *See*—
Voss, Thomas C.; Lesperance, Delos P.; and Lindeman, Myron F., 4,611,768, Cl. 242-55.300.

Lever Brothers Company: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.
Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,612,334, Cl. 521-146.000.
Levin, Lev; Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H. Method for refining microstructures of titanium alloy castings. 4,612,066, Cl. 148-20.300.
Levine, Ernest N.; Lipschutz, Lewis D.; and Quinones, Horatio, to International Business Machines Corporation. Process for forming improved solder connections for semiconductor devices with enhanced fatigue life. 4,611,746, Cl. 228-123.000.
Levinson, Frank H.: *See*—
Cline, Terry W.; Karr, Michael A., III; and Levinson, Frank H., 4,611,886, Cl. 350-96.200.
Lewis, David F.: *See*—
Colquhoun, Howard M.; and Lewis, David F., 4,612,399, Cl. 568-324.000.
Leyen, Adrianus C. W.: *See*—
Spaargaren, Klaas; and Leyen, Adrianus C. W., 4,611,489, Cl. 73-304.00C.
Lezon, Lawrence L.: *See*—
Graffam, Don E.; Lezon, Lawrence L.; and Slaters, Arthur R., Jr., 4,612,225, Cl. 428-116.000.
Liatsos, Charles E.: *See*—
Powell, Jack; and Liatsos, Charles E., 4,612,512, Cl. 330-66.000.
Librecht, Freddy M.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,611,905, Cl. 355-14.00D.
Lichtin, Norman N.; and Vijayakumar, Kallambella M., to Boston University, Trustees of. Method for making ammonia by the reduction of molecular nitrogen. 4,612,096, Cl. 204-157.460.
Liddle, Louis W.: *See*—
Pollara, Frank J.; and Liddle, Louis W., 4,612,026, Cl. 55-274.000.
Liebler, Ralf: *See*—
Besecke, Siegmund; Liebler, Ralf; Hohage, Heinz-Juergen; and Schroeder, Guenter, 4,612,358, Cl. 526-259.000.
Lightner, Linn S.: *See*—
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,611,878, Cl. 339-186.00M.
Liland, Alfred; and Regula, Donald W., to Ethicon, Inc. Surgical wound closure tape. 4,612,230, Cl. 428-167.000.
Lilliwyte Societe Anonyme: *See*—
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,612,266, Cl. 429-221.000.
Lima, Joseph D.: *See*—
Hindman, David B; and Lima, Joseph D., 4,612,116, Cl. 210-333.100.
Lin, Danny. Athletic shoe with display portion and method of making. 4,611,416, Cl. 36-136.000.
Lin, Yeh-Huong, to Hocheng Pottery Mfg. Co., Ltd. Flushing apparatus for urinals. 4,611,356, Cl. 4-301.000.
Lindberg, Per L.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.
Lindell, Courtney D., to Georgia-Pacific Corporation. Pelletizing wood. 4,612,017, Cl. 44-10.00B.
Lindeman, Myron F.: *See*—
Voss, Thomas C.; Lesperance, Delos P.; and Lindeman, Myron F., 4,611,768, Cl. 242-55.300.
Linsky, Nikolai F.: *See*—
Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., 4,611,625, Cl. 137-505.250.
Lion Corporation: *See*—
Oyobe, Masaaki; Ichikawa, Hiromichi; and Maeyama, Tsutomu, 4,612,189, Cl. 424-49.000.
Lippitt, Mark C.: *See*—
Gershenson, Edward; Lemone, Louis A.; Faletra, Salvatore; Caldara, Stephen A.; Lippitt, Mark C.; and Braun, William A., 4,612,613, Cl. 364-200.000.
Lipschutz, Lewis D.: *See*—
Levine, Ernest N.; Lipschutz, Lewis D.; and Quinones, Horatio, 4,611,746, Cl. 228-123.000.
Litton Systems, Inc.: *See*—
Norvell, Gordon S., 4,612,647, Cl. 372-88.000.
Liu, Chain T.; and Stiegler, James O., to United States of America, Energy. Ductile aluminide alloys for high temperature applications. 4,612,165, Cl. 420-459.000.
Liu, Jia-Ming; and Chen, Ying-Chih, to GTE Laboratories Incorporated. Fast polarization-switchable semiconductor lasers. 4,612,645, Cl. 372-45.000.
Livingston, William D.; and Mack, Wayne A., to E-Systems, Inc. Delay modulation phase coding. 4,612,653, Cl. 375-23.000.
Loeb, Karen C.: *See*—
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.
Logsdon, Duane D. Fluid control valve. 4,611,626, Cl. 137-594.000.
Logsdon, Edward E.: *See*—
Grinnan, Edward L.; and Logsdon, Edward E., 4,612,367, Cl. 530-399.000.
Lokken, Oddvin. Spray guard for dental tool. 4,611,992, Cl. 433-116.000.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., to Union Carbide Corporation. Olefin oligomerization. 4,612,406, Cl. 585-329.000.
Long, William B.: *See*—
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,611,878, Cl. 339-186.00M.
Long, William H.; Stappaerts, Eddy A.; and Plummer, Michael J., to Northrop Corporation. Electric glow discharge using prepulse and charge storage device. 4,612,643, Cl. 372-38.000.
L'Oreal: *See*—
Zorayan, Vahan; and Fiquet, Claire, 4,612,188, Cl. 424-47.000.
Lothian, Barry R.: *See*—
Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,612,334, Cl. 521-146.000.
Louisiana State University and Mechanical College: *See*—
Goodrich, Roy G., 4,611,623, Cl. 137-210.000.
Lovell, Edward J.: *See*—
Janisiewicz, Stanley W.; and Lovell, Edward J., 4,611,397, Cl. 29-834.000.
Lowrance Electronics, Inc.: *See*—
Weber, Ronald G., 4,612,633, Cl. 367-115.000.
Lowry, Michael R.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.
Lubrizol Corporation, The: *See*—
DiBiase, Stephen A.; Davis, Kirk E.; and Tagliamonte, Thomas A., 4,612,129, Cl. 252-33.600.
Lucas Industries Public Limited Company: *See*—
Binns, John M.; Caine, Douglas A.; and Spencer, Byron A. T., 4,612,616, Cl. 364-431.020.
Gornall, Graham J., 4,611,691, Cl. 188-71.800.
Luckow, Herbert; Plantikow, Ulrich; and Grone, Siegfried, to Thyssen Aktiengesellschaft. Method and apparatus for the manufacture of cylindrical hollow bodies. 4,611,751, Cl. 228-184.000.
Luecking, R. Kent; and Cravens, James E. Mobile phone mounting. 4,611,734, Cl. 224-42.420.
LuK Lamellen und Kupplungsbau GmbH: *See*—
Friedmann, Oswald, 4,611,701, Cl. 192-110.00B.
Lum, Peter C. Heat pump equipment. 4,611,472, Cl. 62-499.000.
Lund, Arne; Nowakowski, Egon; Nielsen, Elgard; and Nielsen, Per G., to V. Kann Rasmussen Industri A/S. Window, especially for installation in an inclined roof. 4,611,432, Cl. 49-192.000.
Lundy, Charles R.: *See*—
Galanto, Charles; and Lundy, Charles R., 4,611,355, Cl. 2-246.000.
Luther, Ronald B.; and Choksi, Pradip V. Blood oxygenator with dual sparger and reuseable heat exchanger. 4,612,170, Cl. 422-46.000.
Luttge, Sabine: *See*—
Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, 4,612,142, Cl. 252-555.000.
Lyng Industrier A-S: *See*—
Saether, Gustav, 4,611,757, Cl. 236-12.120.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Simeth, Claus, 4,611,538, Cl. 101-365.000.
M & C Products B.V.: *See*—
De Boks, Christiaan, 4,611,836, Cl. 285-158.000.
Maack, Horst E.: *See*—
Piotrowski, Tadeusz W.; and Maack, Horst E., 4,611,934, Cl. 384-517.000.
Maag, Hans: *See*—
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,612,380, Cl. 549-415.000.
Macdougall, John D.; and Cooper, Richard B., to Sprague Electric Company. High voltage integrated circuit. 4,612,563, Cl. 357-40.000.
MacInnis, Martin B.: *See*—
Kim, Tai K.; MacInnis, Martin B.; and McClintic, Robert P., 4,612,182, Cl. 423-593.000.
Kim, Tai K.; Boyer, Carl W.; MacInnis, Martin B.; and Ennis, Donald H., 4,612,183, Cl. 423-593.000.
Mack, Wayne A.: *See*—
Livingston, William D.; and Mack, Wayne A., 4,612,653, Cl. 375-23.000.
Mackey, Joseph E.: *See*—
DellaVecchia, Michael P.; Mackey, Joseph E.; and Steinberg, Albert H., 4,612,238, Cl. 428-228.000.
Mackie, Ronald D. L.: *See*—
Bentall, Richard H. C.; Cox, Timothy J.; and Mackie, Ronald D. L., 4,611,599, Cl. 128-422.000.
MacKissinger, William, Jr.; and Phillips, Howard C., to AMP Incorporated. Quick change mounting plate. 4,611,484, Cl. 72-481.000.
Madan, Deepak S.: *See*—
German, Randall M.; Lall, Chaman; and Madan, Deepak S., 4,612,048, Cl. 75-246.000.
Maeda, Miharu: *See*—
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.
Maeda, Tetsuro; Onaya, Kyoji; and Okamoto, Akihiro, to Denki Kagaku Kogyo K. K. Resin composition and plated article thereof. 4,612,253, Cl. 428-521.000.
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, to Hitachi, Ltd. Drive circuit for driving a transistor. 4,612,451, Cl. 307-270.000.
Maeyama, Tsutomu: *See*—
Oyobe, Masaaki; Ichikawa, Hiromichi; and Maeyama, Tsutomu, 4,612,189, Cl. 424-49.000.

Magnetic Controls Company: *See—*
Roberts, Harold, 4,611,884, Cl. 350-96.150.

Mahlkow, Hartmut; and Blasing, Horst, to Schering Aktiengesellschaft. Method and device for the treatment of printed circuit boards. 4,611,554, Cl. 118-316.000.

Maier, Alfred E.; Farley, James R.; and Tomasic, Nicholas A., to Westinghouse Electric Corp. Arc chute assembly for circuit breaker. 4,612,426, Cl. 200-144.00R.

Maintenance Technology, Inc.: *See—*
Bazarnik, Louis M., 4,612,623, Cl. 364-569.000.

Maki, Yoshitaka: *See—*
Terao, Shinji; and Maki, Yoshitaka, 4,612,321, Cl. 514-338.000.

Makino, Naonori; Horie, Seiji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photosensitive composition comprising azo compounds. 4,612,271, Cl. 430-72.000.

Makita, Hiroshi: *See—*
Inui, Koichi; and Makita, Hiroshi, 4,611,591, Cl. 128-205.240.

Mallinckrodt, Inc.: *See—*
Dean, Richard T., 4,612,185, Cl. 424-2.000.

Maltais, Andre ; and Nadeau, Andre , to Maritonex Inc. Alarm system for monitoring the temperature of a liquid contained in a reservoir. 4,612,537, Cl. 340-596.000.

Mandai, Haruhumi; Nakamura, Kazutaka; Naito, Yasuyuki; and Iwai, Kiyoshi, to Murata Manufacturing Co., Ltd. Non-linear electrical resistor having varistor characteristics. 4,612,140, Cl. 252-520.000.

Manfredo, Louis J.: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.

Mangla, Raj K., to Mobil Oil Corporation. Process and apparatus for thermoforming a thermoplastic carton having an aperture therein for latching the cover. 4,612,153, Cl. 264-154.000.

Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., to SWS Silicones Corporation. Stabilized blends of thiofunctional polysiloxane fluids and organopolysiloxane fluids and a process for stabilizing the same. 4,612,055, Cl. 106-287.110.

Mannesmann Aktiengesellschaft: *See—*
Heilmann, Wolfgang; Lenze, Friedrich; Missaire, Gerhard; and Winter, Friedrich, 4,611,838, Cl. 285-331.000.

Mantoku, Hitoshi: *See—*
Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, 4,612,148, Cl. 264-49.000.

MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,611,959, Cl. 408-180.000.

Marbourg, Edgar F., Jr. Tool for control and use of miniature screws and threaded fasteners. 4,611,515, Cl. 81-454.000.

Marchant, Jeffrey D., to Motorola Inc. Method of performing real input fast fourier transforms simultaneously on two data streams. 4,612,626, Cl. 364-726.000.

Mares, Frank: *See—*
Muccigrosso, Deborah A.; Mares, Frank; Diamond, Steven E.; and Solar, Jeffrey P., 4,612,402, Cl. 568-408.000.

Maritonex Inc.: *See—*
Maltais, Andre ; and Nadeau, Andre , 4,612,537, Cl. 340-596.000.

Marker International: *See—*
Knabel, Walter; and Klubitschko, Gerd, 4,611,497, Cl. 73-862.680.

Marra, Jerome F., to Owens-Corning Fiberglas. Method and apparatus for forming glass fibers. 4,612,027, Cl. 65-1.000.

Martenson, Donald S. Low emission stove. 4,611,572, Cl. 126-77.000.

Marti, Wilhelm; and Burri, Leo, to Boa A. G. Luzern. Compensator for the compensation of axial movements of pipe conduits. 4,611,827, Cl. 285-3.000.

Martin, Alexander: *See—*
Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,612,334, Cl. 521-146.000.

Martin Engineering Company: *See—*
Stahura, Richard P., 4,611,498, Cl. 73-864.410.

Martin, Eugene R.: *See—*
Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., 4,612,055, Cl. 106-287.110.

Martin, Frank J. Door control mechanism. 4,611,840, Cl. 292-177.000.

Martin, John C.: *See—*
Verheyden, Julien P. H.; and Martin, John C., 4,612,314, Cl. 514-261.000.

Martin, Trevor: *See—*
Tavares, Antonio; and Martin, Trevor, 4,611,399, Cl. 29-876.000.

Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, to Kabushiki Kaisha Kibun. Method of heating kneaded marine paste products. 4,612,201, Cl. 426-511.000.

Marvin Glass & Associates: *See—*
Morrison, Howard J., 4,611,812, Cl. 273-400.000.

Masaki, Shinzaburo: *See—*
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, 4,612,394, Cl. 564-420.000.

Maschinenfabrik Andritz Actiengesellschaft: *See—*
Eustacchio, Peter; Perchthaler, Heinz; and Syrowatka, Rupert, 4,612,123, Cl. 210-709.000.

Maschinenfabrik J. Dieffenbacher GmbH: *See—*
Bielfeldt, Friedrich B., 4,611,983, Cl. 425-544.000.

Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See—*
Kasper, Rolf; and Bielfeldt, Friedrich B., 4,612,081, Cl. 156-583.100.

Maslanka, Michael B.: *See—*
Bennett, Terry A.; Zimmerman, William B.; and Maslanka, Michael B., 4,612,031, Cl. 65-106.000.

Massey, Harold E., Sr.; and Hamm, Ronald L. Wheel support assembly for a boat. 4,611,820, Cl. 280-414.200.

Massey, Richard T.: *See—*
Kramer, Daniel P.; and Massey, Richard T., 4,612,029, Cl. 65-59.240.

Masuda, Shigeru: *See—*
Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, 4,612,427, Cl. 200-144.00R.

Masuoka, Fujio; and Iizuka, Hisakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing E^2PROM. 4,612,212, Cl. 427-91.000.

Mathais, Henri: *See—*
Bertocchio, Rene; Genest, Bernard; and Mathais, Henri, 4,612,133, Cl. 252-68.000.

Matsui, Kazuhiro; Wada, Hideo; Nakano, Yoshihito; and Hayashi, Toshihiro, to Kitagawa Industries Co., Ltd. Lead wire holder. 4,611,868, Cl. 339-59.00M.

Matsumoto, Hiroshi: *See—*
Ogata, Masaru; Matsumoto, Hiroshi; Kida, Shiro; and Tawara, Katsuya, 4,612,322, Cl. 514-383.000.

Matsumoto, Ikuo: *See—*
Nakamura, Takeshi; Ando, Kenji; and Matsumoto, Ikuo, 4,612,471, Cl. 310-321.000.

Matsumoto, Mamoru: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,612,317, Cl. 514-292.000.

Matsumoto, Shusaku: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.

Matsumoto, Toshiyuki: *See—*
Suzuki, Mikio; and Matsumoto, Toshiyuki, 4,612,656, Cl. 377-24.000.

Matsumura, Hiroyoshi: *See—*
Katsuyama, Toshio; Satoh, Shin; and Matsumura, Hiroyoshi, 4,612,294, Cl. 501-40.000.

Matsuoka, Mitsuyuki; and Ohnishi, Masanobu, to Tokai Rubber Industries Ltd. Hose joint. 4,611,832, Cl. 285-55.000.

Matsuoka, Toshio; and Kurozu, Shinichi, to Sumitomo Heavy Industries, Ltd. Process for recovering valuable metals from an iron dust containing a higher content of zinc. 4,612,041, Cl. 75-10.140.

Matsuoka, Yuji: *See—*
Iwata, Isamu; Hosoe, Hirotaro; and Matsuoka, Yuji, 4,611,553, Cl. 118-50.000.

Matsuoka, Yuzo: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,612,317, Cl. 514-292.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Komatsu, Takashi; and Ishino, Yasuo, 4,611,365, Cl. 15-339.000.
Miyata, Takeo; Ono, Takuhiro; and Iwabuchi, Takashi, 4,612,234, Cl. 428-215.000.
Tanno, Masuo; and Yamada, Yuichiro, 4,612,099, Cl. 204-92.320.
Yoshizumi, Keiichi, 4,611,916, Cl. 356-349.000.

Matsushita Electronics Corporation: *See—*
Ashizaki, Shigeya; Natsuhara, Masao; Sugahara, Koichi; and Muranishi, Hideo, 4,612,474, Cl. 313-414.000.

Matsutani, Kanji, to Matsutani Seisakusho. Method of manufacturing a dental root canal cutting tool and apparatus therefor. 4,611,509, Cl. 76-24.00R.

Matsutani Seisakusho: *See—*
Matsutani, Kanji, 4,611,509, Cl. 76-24.00R.

Matsuura, Ryoichi: *See—*
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.

Matsuyama, Shinichi, to Canon Kabushiki Kaisha. Voltage detecting device. 4,611,898, Cl. 354-484.000.

Matthes, Hans G.; and Wittenbecher, Hasso, to A.E.G. Elotherm GmbH. Starting circuit for a parallel resonant circuit inverter. 4,612,611, Cl. 363-49.000.

Matthewson, Randall W.: *See—*
Braly, John L.; and Matthewson, Randall W., 4,611,962, Cl. 410-57.000.

Matukuma, Akira; Takahashi, Yohji; and Kondo, Yoshihiko, to Mitsubishi Chemical Industries, Ltd. Repellent compositions against insects, ticks and mites employing mixtures of O-alkyl-N-phenylthiocarbamates and Deet. 4,612,327, Cl. 514-479.000.

Matumura, Hideki, to Nissan Motor Co., Ltd. Automatic take-up motion of loom. 4,611,638, Cl. 139-304.000.

Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with oxo-quinazoline-(thiono)-phosphoric(phosphonic) acid esters and ester-amides. 4,612,305, Cl. 514-80.000.

Max-Planck-Gesellschaft zur Foederung der Wissenschaften: *See—*
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, 4,612,365, Cl. 530-301.000.

May, James D.; and Gosselin, Charles E., to United Technologies Corporation. Probe for coordinate measuring machine. 4,612,622, Cl. 364-560.000.

May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., to Power Climber, Incorporated. Efficient lightweight hoist with multiple-cable-size traction and safety systems. 4,611,787, Cl. 254-267.000.

Maydew, Peter H.: *See—*
Westwood, James S.; and Maydew, Peter H., 4,612,484, Cl. 315-384.000.

Mayne, Harry H.: *See—*
Quenneville, Raymond N.; Mayne, Harry H.; and Sickler, Kenneth H., 4,611,960, Cl. 409-234.000.

Mazda Motor Corporation: *See—*
Kawano, Saige, 4,611,749, Cl. 228-176.000.

McAlister, Michael P.: *See—*
Coleman, Robert D.; and McAlister, Michael P., 4,612,287, Cl. 435-172.300.

McAllister, Jerome W.: *See—*
Vesley, George F.; Zimmerman, Patrick G.; Chamberlain, Craig S.; and McAllister, Jerome W., 4,612,242, Cl. 428-313.900.

McCaffrey, David J. A.; Rogers, Percy E.; and Carlton, James, to Coal Industry (Patents) Ltd. Continuous sorption process. 4,612,405, Cl. 568-916.000.

McCardle, Gordon R. Chain saw attachment. 4,611,521, Cl. 83-796.000.

McCarty, Franklin R.: *See—*
Redenbarger, Philip D.; and McCarty, Franklin R., 4,611,680, Cl. 180-69.240.

McCarty, George W.; and Smith, Somers H., III, to Solid State Chargers Research & Development Limited Partnership. Charger for batteries. 4,612,491, Cl. 320-2.000.

McClintic, Robert P.: *See—*
Kim, Tai K.; McClintic, Robert P.; and Vanderpool, Clarence D., 4,612,180, Cl. 423-593.000.
Kim, Tai K.; MacInnis, Martin B.; and McClintic, Robert P., 4,612,182, Cl. 423-593.000.

McCormick, Peter E.; Edwards, Rick C.; and Crawford, Keith R., to EOA Systems, Inc. Interchangeable robot end-of-arm tooling system. 4,611,377, Cl. 29-407.000.

McFarland, John H. Device for setting the intonation of the individual strings of a fretted string instrument. 4,611,523, Cl. 84-313.000.

McGlen, James A.: *See—*
Parsons, Michael H.; and McGlen, James A., 4,611,800, Cl. 271-3.100.

McIntosh, Thomas K., to Bloomfield Manufacturing Company, Inc., The. Cab guard. 4,611,824, Cl. 280-748.000.

McKay International Engineers: *See—*
Dewing, Kenneth F.; Harlander, Donald C.; and Hughes, Ralph O., 4,611,817, Cl. 280-145.000.

McKeage, Roy A.: *See—*
Meulenberg, John H.; and McKeage, Roy A., 4,611,367, Cl. 24-33.00P.

McLaughlin, Edward T.: *See—*
Young, Richard H.; and McLaughlin, Edward T., 4,611,513, Cl. 81-53.200.

McLaughlin, Hugh R. Apparatus for removing water from the ground. 4,611,970, Cl. 415-6.000.

McLeod, J. C.: *See—*
Tressler, Duane W.; and McLeod, J. C., 4,611,571, Cl. 124-7.000.

McMurtrie, Andrew: *See—*
Reynolds, Martin L.; Frank, Dorothy M.; Riehl, Tilford F.; and McMurtrie, Andrew, 4,611,607, Cl. 131-336.000.

Medical Engineering Corp.: *See—*
Finney, Roy P., 4,611,584, Cl. 128-79.000.

Medtronic, Inc.: *See—*
Phillips, Gary M.; and Benjamin, Albert S., 4,611,395, Cl. 29-623.200.

Meffert, Alfred: *See—*
Scheuffgen, Ingeborg; and Meffert, Alfred, 4,612,192, Cl. 424-70.000.

Megowen, William. Container closure with expandable anti-missiling section. 4,611,723, Cl. 215-252.000.

Mehrotra, Sanjay; and Perlegos, Gust, to Seeq Technology, Inc. Error checking and correction circuitry for use with an electrically-programmable and electrically-erasable memory array. 4,612,640, Cl. 371-51.000.

Meiring, Willem J., to Tobacco Research and Development Institute Limited. Weighbelt apparatus. 4,611,676, Cl. 177-50.000.

Meister, Pierre-Andre ; and Koch, Daniel, to ETA SA Fabriques d'Ebauches. Electronic timepiece having means for correcting the seconds indication. 4,611,927, Cl. 368-188.000.

Melloch, Michael R.: *See—*
Jelks, Edward C.; and Melloch, Michael R., 4,612,085, Cl. 156-643.000.

Memorex Corporation: *See—*
Sordello, Frank J.; and Rose, Andrew M., 4,612,586, Cl. 360-31.000.
Wagner, Ronald H., 4,612,517, Cl. 331-46.000.

Menard, Hugues: *See—*
Lalancette, Jean-Marc; and Menard, Hugues, 4,612,178, Cl. 423-338.000.

Menter, Gerald A.: *See—*
Menter, J. Alan; and Menter, Gerald A., 4,611,986, Cl. 431-320.000.

Menter, J. Alan; and Menter, Gerald A., to Hollowick Inc. Disposable liquid fuel burner. 4,611,986, Cl. 431-320.000.

Mentor Ing. Dr. Paul Mozar: *See—*
Weyer, Erhard; and Zuchner, Werner, 4,612,602, Cl. 361-394.000.

Mercer, James M., to Heinemann Electric Company. Circuit breaker mechanism. 4,612,523, Cl. 335-26.000.

Merck & Co., Inc.: *See—*
Nutt, Ruth F., 4,612,366, Cl. 530-311.000.

Merian, Jacques S.: *See—*
Goldberg, Newton N.; and Merian, Jacques S., 4,612,246, Cl. 428-379.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Hibert, Marcel; and Gittos, Maurice W., 4,612,312, Cl. 514-225.000.

Merwarth, Richard J.: *See—*
Miaskoff, Leonard; and Merwarth, Richard J., 4,611,533, Cl. 100-7.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Pohl, Wulf-Dieter; and Krohn, Ernst-Otto, 4,611,616, Cl. 137-15.100.

Messersmith, William K.; and Bach, Lloyd G., to Allied Corporation. Brake control device. 4,611,696, Cl. 192-13.00A.

Metalines, Inc.: *See—*
Wilson, Michael D.; and Schmitt, Dale A., 4,611,449, Cl. 52-278.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Fischer, Herbert; and Kriebel, Manfred, 4,612,020, Cl. 55-40.000.

Methane Drainage Ventures: *See—*
Richards, Walter L., 4,611,855, Cl. 299-2.000.

Meulenberg, John H.; and McKeage, Roy A., to Clipper Belt Lacer Company. Hook keeper for belt lacings. 4,611,367, Cl. 24-33.00P.

Meunier, Hubert G., to United States of America, Navy. Nickel oxide battery cathode prepared by ozonation. 4,612,213, Cl. 427-126.600.

Meyer, Dieter: *See—*
Geke, Juergen; and Meyer, Dieter, 4,612,058, Cl. 134-38.000.

Miake, Fumio: *See—*
Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, 4,612,283, Cl. 435-68.000.

Miaskoff, Leonard; and Merwarth, Richard J., to Harris Graphics Corporation. Tying apparatus. 4,611,533, Cl. 100-7.000.

Mid-Florida Corporation: *See—*
Carter, Jerie W., Sr., 4,611,641, Cl. 141-4.000.

Mikuni Kogyo Kabushiki Kaisha: *See—*
Miyano, Takashi, 4,611,564, Cl. 123-478.000.

Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Multiple-impact shock absorbing means for circuit interrupter and other apparatus. 4,612,429, Cl. 200-288.000.

Miller Brewing Company: *See—*
Goldstein, Henry; Cronan, Charles L.; and Chicoye, Etzer, 4,612,196, Cl. 426-14.000.

Miller, Guy W.: *See—*
Hetzer, Frederick C.; and Miller, Guy W., 4,611,464, Cl. 60-39.161.

Miller, James E., Jr.; and Dilling, Peter, to Westvaco Corporation. Water-based printing ink compositions containing a lignin acetate binder. 4,612,051, Cl. 106-30.000.

Miller, Michael J.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; and Miller, Michael J., 4,612,039, Cl. 75-0.5AA.

Milliken Research Corporation: *See—*
Sinclair, Harold C., 4,611,362, Cl. 15-230.150.

Mills, Darrell: *See—*
Mills, Mark; and Mills, Darrell, 4,611,358, Cl. 7-157.000.

Mills, Mark; and Mills, Darrell. Device for tube cutting, reaming and bending. 4,611,358, Cl. 7-157.000.

Mills, William J.: *See—*
Pardes, Herman; and Mills, William J., 4,612,441, Cl. 250-342.000.

Minami, Akira; Nakao, Sho; and Nakayama, Takao, to Fuji Photo Film Co., Ltd. Liquid removing method. 4,611,409, Cl. 34-9.000.

Minnesota Mining and Manufacturing Company: *See—*
Schwartz, Mark E., 4,612,052, Cl. 106-31.000.
Vesley, George F.; Zimmerman, Patrick G.; Chamberlain, Craig S.; and McAllister, Jerome W., 4,612,242, Cl. 428-313.900.

Minolta Camera Kabushiki Kaisha: *See—*
Wada, Kanji, 4,611,904, Cl. 355-14.0SH.

Miranti, Joseph P., Jr., to Dayco Corporation. Transverse belt elements for a belt construction. 4,612,005, Cl. 474-201.000.

Mishima, Fumiyuki: *See—*
Takenoya, Hideaki; and Mishima, Fumiyuki, 4,611,940, Cl. 400-649.000.

Mishima, Yasuhiro: *See—*
Nishiyama, Kazuo; Mishima, Yasuhiro; and Kuwayama, Kiyoaki, 4,611,793, Cl. 267-52.000.

Missaire, Gerhard: *See—*
Heilmann, Wolfgang; Lenze, Friedrich; Missaire, Gerhard; and Winter, Friedrich, 4,611,838, Cl. 285-331.000.

Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Incorporated. Process for producing N-acylphenylalanines. 4,612,388, Cl. 562-443.000.

Mitchell, Kenneth M.: *See—*
Angevine, Philip J.; Mitchell, Kenneth M.; Oleck, Stephen M.; and Shih, Stuart S., 4,612,108, Cl. 208-111.000.

Mito, Yoshio: *See—*
Nakamura, Kazuharu; Mito, Yoshio; and Takeuchi, Kazuhiko, 4,611,574, Cl. 126-201.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Matukuma, Akira; Takahashi, Yohji; and Kondo, Yoshihiko, 4,612,327, Cl. 514-479.000.

Mitsubishi Denki Kabushik Kaisha: *See—*
Katashima, Tadashi; and Iwaki, Yoshiyuki, 4,612,493, Cl. 320-64.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kawamura, Toshimi, 4,612,494, Cl. 322-4.000.
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.

Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, 4,612,427, Cl. 200-144.00R.
Okita, Ryosuke; and Okamoto, Kiyohide, 4,611,697, Cl. 192-21.500.
Tsuji, Shintaro, 4,612,624, Cl. 364-581.000.
Wada, Fumio; Ishijima, Koji; Sano, Fumiaki; and Asami, Kazutomo, 4,611,473, Cl. 62-503.000.
Yamauchi, Takao; Suzuki, Hayato; Iwabuchi, Osamu; and Kishimoto, Toshinobu, 4,612,495, Cl. 322-100.000.
Yoshida, Masayuki; and Suzuki, Shota, 4,611,689, Cl. 187-29.00R.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sasaki, Isao; Mori, Hiroshi; and Fujimoto, Masaharu, 4,612,363, Cl. 528-274.000.

Mitsufuji, Takashi, to Tsubakimoto Chain Co. Hinge-type table top chain. 4,611,710, Cl. 198-803.010.

Mitsui Petrochemical Industries, Ltd.: *See*—
Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, 4,612,148, Cl. 264-49.000.
Sagane, Toshihiro; and Nagano, Riichiro, 4,612,252, Cl. 428-516.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; and Yamaguchi, Akihiro, 4,612,388, Cl. 562-443.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Morita, Hideo; Abiko, Kenji; and Nakamura, Tetsuo, 4,611,403, Cl. 33-169.00R.
Suzuki, Mikio; and Matsumoto, Toshiyuki, 4,612,656, Cl. 377-24.000.

Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, to Hitachi, Ltd. Method of forming phosphor pattern on fluorescent screen for color picture tubes with polymer coagulent. 4,612,268, Cl. 430-28.000.

Miyagishima, Toshikazu: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,612,317, Cl. 514-292.000.

Miyahara, Kingo, to Dowa Co., Ltd. Method of and apparatus for producing processed foodstuffs by passing an electric current. 4,612,199, Cl. 426-237.000.

Miyakawa, Kazuo, to Yoshida Kogyo K. K. Apparatus for attaching fly strips to a slide fastener chain. 4,611,546, Cl. 112-121.270.

Miyakawa, Shinpei; and Kinbara, Masaaki, to Ebara Corporation. Pressure control valve and oil supply device using said valve. 4,611,621, Cl. 137-115.000.

Miyamoto, Shigeru: *See*—
Naito, Michinori; and Miyamoto, Shigeru, 4,612,511, Cl. 329-124.000.

Miyanaga, Choshichi; Sakurai, Yoshihiko; Iida, Katsumi; and Hagiwara, Akihiro, to Diesel Kiki Co., Ltd. Automobile air conditioner system with improved temperature control device. 4,611,755, Cl. 236-13.000.

Miyano, Takashi, to Mikuni Kogyo Kabushiki Kaisha. Electronically controlled fuel injection device. 4,611,564, Cl. 123-478.000.

Miyata, Takeo; Ono, Takuhiro; and Iwabuchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Anti-reflection coating film suitable for application on optics made of mixed crystals of thallium iodide and thallium bromide. 4,612,234, Cl. 428-215.000.

Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Idling speed control system of an internal combustion engine. 4,611,560, Cl. 123-339.000.

Miyazawa, Hiroyuki: *See*—
Shimizu, Shinji; and Miyazawa, Hiroyuki, 4,612,565, Cl. 357-71.000.

Miyazawa, Sadayuki: *See*—
Tsuboi, Norio; Furukawa, Noboru; and Miyazawa, Sadayuki, 4,612,018, Cl. 55-15.000.

Miyoshi, Tadahiko: *See*—
Sakamoto, Hiroshi; and Miyoshi, Tadahiko, 4,612,296, Cl. 501-93.000.

Miyoshi, Takahito: *See*—
Ushimaru, Akira; Fujiyama, Masaaki; Okutu, Toshimitu; and Miyoshi, Takahito, 4,612,235, Cl. 428-216.000.

Mizobe, Akio: *See*—
Genba, Tsuneo; Mizobe, Akio; Okazaki, Masaki; and Sakuragi, Isao, 4,612,157, Cl. 264-185.000.

Mizrahi, Albert: *See*—
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.

MMT Inc.: *See*—
Takeda, Hirofumi, 4,611,376, Cl. 29-235.000.

Mobil Oil Corporation: *See*—
Angevine, Philip J.; Mitchell, Kenneth M.; Oleck, Stephen M.; and Shih, Stuart S., 4,612,108, Cl. 208-111.000.
Mangla, Raj K., 4,612,153, Cl. 264-154.000.

Modak, Shanta M.: *See*—
Fox, Charles L., Jr.; and Modak, Shanta M., 4,612,337, Cl. 523-113.000.

Moddel, Garret R.; Christel, Lee A.; and Gibbons, James F., to Sera Solar Corporation. Electrically isolated semiconductor integrated photodiode circuits and method. 4,612,408, Cl. 136-244.000.

Mogami, Takao: *See*—
Kawashima, Hiroshi; Mogami, Takao; and Kubota, Satoshi, 4,611,892, Cl. 351-159.000.

Moggi, Giovanni: *See*—
Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, 4,612,351, Cl. 525-199.000.

Molignoni, Albert J., to Power Shaft Engine, Limited Partnership. Heat exchanger. 4,611,655, Cl. 165-163.000.

Moller, Craig A.; and Wolter, Eric H., to Abar Ipsen Industries. Heat treating furnace with heating element hangers and radiation shield spacers. 4,612,651, Cl. 373-130.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,611,537, Cl. 101-111.000.

Monolithic Memories, Inc.: *See*—
Sharp-Geisler, Bradley A., 4,612,432, Cl. 219-121.0PG.

Monsanto Company: *See*—
Ort, Morris R., 4,612,360, Cl. 528-182.000.

Montagne, Antonius J. M.: *See*—
Kleefstra, Marcus; Montagne, Antonius J. M.; and Pathuis, Jan W., 4,612,521, Cl. 333-165.000.

Montedison S.p.A.: *See*—
Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, 4,612,351, Cl. 525-199.000.
Vittone, Andrea; Camprincoli, Pierpaolo; and Grandona, Adriano, 4,612,229, Cl. 428-155.000.

Monza, Enrico: *See*—
Caporiccio, Gerardo; Monza, Enrico; Bonardelli, Piergiorgio; Moggi, Giovanni; and Cirillo, Gianna, 4,612,351, Cl. 525-199.000.

Moon, Frederick H., to Zenith Electronics Corporation. Constant Z bandswitched input filter. 4,612,571, Cl. 358-86.000.

Mooney Chemicals, Inc.: *See*—
Hein, Richard W., 4,612,255, Cl. 428-541.000.

Moore, Boyd B.: *See*—
Kendall, Clarence E., Jr.; and Moore, Boyd B., 4,611,656, Cl. 166-65.100.

Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing 2,2'-azobis(2-methylbutanenitrile). 4,612,368, Cl. 534-578.000.

Moplefan S.p.A.: *See*—
Vittone, Andrea; Camprincoli, Pierpaolo; and Grandona, Adriano, 4,612,229, Cl. 428-155.000.

Morgan, Ricky D.; Sylvester, Vito P.; and Ward, Robert L., to GTE Products Corporation. Method for producing a high density metal article. 4,612,162, Cl. 419-28.000.

Mori, Hiroshi: *See*—
Sasaki, Isao; Mori, Hiroshi; and Fujimoto, Masaharu, 4,612,363, Cl. 528-274.000.

Mori, Hirotaro; and Fujita, Hiroshi, to Osaka University. Method of producing a composite material composed of a matrix and an amorphous material. 4,612,059, Cl. 148-4.000.

Mori, Kei. Light source device. 4,612,605, Cl. 362-32.000.

Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Switch. 4,612,427, Cl. 200-144.00R.

Morishita, Hajime: *See*—
Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, 4,612,268, Cl. 430-28.000.

Morita, Arihiko: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Morita, Hideo; Abiko, Kenji; and Nakamura, Tetsuo, to Mitutoyo Mfg. Co., Ltd. Surface tracer. 4,611,403, Cl. 33-169.00R.

Moriya, Mikio, to Citizen Watch Co., Ltd. Apparatus for producing a reset pulse for a printer. 4,611,536, Cl. 101-93.210.

Morris, Robert S.: *See*—
Walsh, Myles A.; and Morris, Robert S., 4,612,247, Cl. 428-402.000.

Morrison, Andrew D.; and Daud, Taher, to United States of America, National Aeronautics and Space Administration. Method for growing low defect, high purity crystalline layers utilizing lateral overgrowth of a patterned mask. 4,612,072, Cl. 148-175.000.

Morrison, Howard J., to Marvin Glass & Associates. Ball game goal. 4,611,812, Cl. 273-400.000.

Morse, John E., to Eastman Kodak Company. Sheet registration means. 4,611,942, Cl. 402-79.000.

Morton, Ronald R. Tool for removing packing. 4,611,510, Cl. 81-8.100.

Mosinee Paper Corporation: *See*—
Voss, Thomas C.; Lesperance, Delos P.; and Lindeman, Myron F., 4,611,768, Cl. 242-55.300.

Moss, James A., to Willett International Limited. Label laminating method. 4,612,076, Cl. 156-249.000.

Motojima, Hideaki; Takayama, Hiroki; and Ohura, Jun-ichi, to Kabushiki Kaisha Toshiba. PNPN switch device with capacitor formed outside active device areas. 4,612,562, Cl. 357-38.000.

Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, to Mitsui Petrochemical Industries, Ltd. Process for producing stretched articles of ultrahigh-molecular-weight polyethylene. 4,612,148, Cl. 264-49.000.

Motorola, Inc.: *See*—
Abt, Edgar J., 4,611,871, Cl. 339-93.00C.
Blair, Kelvin R.; Furman, Lynn C.; and Knott, David M., 4,611,389, Cl. 29-589.000.

Cho, Frederick Y.; Joseph, John R.; and Seese, Philip A., 4,612,274, Cl. 430-296.000.
Hines, John R., 4,612,496, Cl. 323-315.000.
Marchant, Jeffrey D., 4,612,626, Cl. 364-726.000.
Sood, Lal C., 4,612,461, Cl. 307-475.000.
Ulmer, Richard W., 4,612,497, Cl. 323-315.000.
Zdunek, Kenneth J.; and Hess, Garry C., 4,612,415, Cl. 179-2.0EB.

Moussie, Michel: *See—*
Gloaguen, Gilbert Y. M.; and Moussie, Michel, 4,612,460, Cl. 307-475.000.

Moyer, Harold W., to AT&T Bell Laboratories. Plastic integrated circuit package. 4,612,564, Cl. 357-70.000.

MP Video, Inc.: *See—*
Prenovitz, Melvin B.; and Hori, Koichiro, 4,611,888, Cl. 350-96.220.

MTD Products Inc.: *See—*
Ballard, Louis F., 4,611,669, Cl. 172-545.000.

MTU Motoren- und Turbinen-Union Munchen GmbH: *See—*
Huther, Werner, 4,612,146, Cl. 264-29.600.

Muccigrosso, Deborah A.; Mares, Frank; Diamond, Steven E.; and Solar, Jeffrey P., to Allied Corporation. Oxidation of olefins using rhodium nitro complex. 4,612,402, Cl. 568-408.000.

Muchow, John D.; and Pelata, Kenneth L., to Hydril Company. Single hydraulic line choke valve system. 4,611,630, Cl. 137-625.370.

Muchowski, Joseph M.; and Greenhouse, Robert, to Syntex (U.S.A) Inc. 5-Aroyl-6-alkylthio-1,2-dihydro-3H-pyrrolo(1,2-A)pyrrole-1-carboxylic acids and use thereof as analgesics and anti-inflammatories. 4,612,325, Cl. 514-413.000.

Mueller, Claus D.: *See—*
Franke, Albrecht; Gries, Josef; Mueller, Claus D.; and Lenke, Dieter, 4,612,320, Cl. 514-317.000.

Mueller, Walter B.; and Schoenberg, Julian H., to W. R. Grace & Co., Cryovac Div. Blown bubble process for producing oriented thin films. 4,612,245, Cl. 428-340.000.

Mufti, Khisar S.: *See—*
Khan, Riaz A.; Mufti, Khisar S.; and Patel, Gita D., 4,612,373, Cl. 536-120.000.

Muggli, Jurg: *See—*
Buehler, Richard; Muggli, Jurg; Scheidweiler, Andreas; and Schibli, Eugen, 4,612,534, Cl. 340-505.000.

Muller, Alfred: *See—*
Burkel, Rainer; Muller, Alfred; Peter, Cornelius; and Schwab, Manfred, 4,611,507, Cl. 74-866.000.

Muller-Beckmann, Bernd: *See—*
Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, 4,612,313, Cl. 514-255.000.

Muller-Odenwald, Hermann E., to SRM Svenska Rotor Maskiner Aktiebolag. Method and apparatus for reheating of cleaned gases subsequent to wet cleaning of raw gases. 4,612,024, Cl. 55-80.000.

Mund, Konrad: *See—*
Botvidsson, Lars; and Mund, Konrad, 4,611,604, Cl. 128-784.000.
Edeling, Martin; Freller, Helmut; Mund, Konrad; and Schack, Peter, 4,612,100, Cl. 204-192.150.

Munroe, Ronald G., to Eagle Electric Mfg. Co. Inc. Line switch. 4,612,423, Cl. 200-16.00R.

Muntz, Ronald L.: *See—*
Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., 4,612,055, Cl. 106-287.110.

Murakami, Terukiyo, to Nissan Motor Company, Limited. Throttle control system for automotive vehicle. 4,612,615, Cl. 364-431.070.

Muramatsu, Kenji, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Speed governor. 4,612,469, Cl. 310-93.000.

Muranishi, Hideo: *See—*
Ashizaki, Shigeya; Natsuhara, Masao; Sugahara, Koichi; and Muranishi, Hideo, 4,612,474, Cl. 313-414.000.

Murata Manufacturing Co., Ltd.: *See—*
Mandai, Haruhumi; Nakamura, Kazutaka; Naito, Yasuyuki; and Iwai, Kiyoshi, 4,612,140, Cl. 252-520.000.
Nakamura, Takeshi; Ando, Kenji; and Matsumoto, Ikuo, 4,612,471, Cl. 310-321.000.

Murata, Masayoshi: *See—*
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, 4,612,376, Cl. 544-317.000.

Murata, Moriyasu: *See—*
Kuroda, Mutsumi; and Murata, Moriyasu, 4,612,137, Cl. 252-174.190.

Murata, Tomomi: *See—*
Omata, Hiroyasu; Ito, Satoshi; and Murata, Tomomi, 4,612,095, Cl. 204-144.500.

Murley, Jackie D.: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, 4,611,987, Cl. 425-131.100.

Murray Corporation: *See—*
Kish, Arthur S., 4,611,750, Cl. 228-184.000.

Musha, Shuji: *See—*
Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, 4,612,561, Cl. 357-38.000.

Musinski, Donald L., to KMS Fusion, Inc. Microminiature refrigerator. 4,611,474, Cl. 62-514.00R.

Musschoot, Albert, to General Kinematics. Method and apparatus for cooling foundry sand. 4,611,469, Cl. 62-100.000.

Musschoot, Albert: *See—*
Kraus, Richard B.; and Musschoot, Albert, 4,611,709, Cl. 198-764.000.

Muth, Karl-Heinz, to Ernst Leitz Wetzlar GmbH. Process and apparatus for executing a plurality of mutually complementary microscopic investigations. 4,611,493, Cl. 73-606.000.

Mutoh, Masakazu: *See—*
Segoshi, Toru; and Mutoh, Masakazu, 4,612,607, Cl. 362-267.000.

Muzechuk, Richard A., to General Motors Corporation. Hydraulic-elastomeric mount. 4,611,795, Cl. 267-140.100.

Myer, Jon H., to Hughes Aircraft Company. Two-dimensional optics element for correcting aberrations. 4,611,883, Cl. 350-96.120.

Mykkanen, C. Fred, to Honeywell Inc. Electrician's tool. 4,611,511, Cl. 81-9.440.

Mynderse, Jon S.; and Bonjouklian, Rosanne, to Eli Lilly and Company. Antiinflammatory method. 4,612,330, Cl. 514-557.000.

Naarden International N.V.: *See—*
Vos, Cornelis; and Brasser, Jan, 4,611,608, Cl. 131-354.000.

Nabisco Brands, Inc.: *See—*
Puglia, Wayne J.; Rosa, Donna M.; DeTora, Sigismondo A.; and Beam, John E., 4,612,195, Cl. 426-3.000.

Nadeau, Andre : *See—*
Maltais, Andre ; and Nadeau, Andre , 4,612,537, Cl. 340-596.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Brake operating device. 4,611,500, Cl. 74-489.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,612,004, Cl. 474-80.000.

Nagano, Riichiro: *See—*
Sagane, Toshihiro; and Nagano, Riichiro, 4,612,252, Cl. 428-516.000.

Nagaoka, Fumio: *See—*
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.

Nagaoka, Makoto; and Sugiyama, Tetsuya, to Pentel Kabushiki Kaisha. Thermal head and manufacturing method thereof. 4,612,433, Cl. 219-216.000.

Nagase, Yoshinori: *See—*
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,612,384, Cl. 558-198.000.

Nagata, Shinji: *See—*
Kasai, Kiyoshi; Tsukidate, Takaaki; Nagata, Shinji; and Arakawa, Toshihiko, 4,612,297, Cl. 501-97.000.

Naito, Michinori; and Miyamoto, Shigeru, to Trio Kabushiki Kaisha. FM demodulator including PLL and improved circuitry for eliminating distortion in the output thereof. 4,612,511, Cl. 329-124.000.

Naito, Yasuyuki: *See—*
Mandai, Haruhumi; Nakamura, Kazutaka; Naito, Yasuyuki; and Iwai, Kiyoshi, 4,612,140, Cl. 252-520.000.

Nakagaki, Shintaro; and Kuriyama, Takashi, to Victor Company of Japan, Ltd. Noise reduction circuit for reducing noise in a color signal of a color video signal. 4,612,570, Cl. 358-36.000.

Nakagawa, Norikazu: *See—*
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.

Nakagome, Keisuke: *See—*
Kamiyama, Yoshiyasu; and Nakagome, Keisuke, 4,612,118, Cl. 210-490.000.

Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, to Kabushiki Kaisha Toshiba. Method for preparing highly heat-conductive substrate and copper wiring sheet usable in the same. 4,611,745, Cl. 228-123.000.

Nakai, Tatsuaki: *See—*
Yamamoto, Nobuyuki; and Nakai, Tatsuaki, 4,611,402, Cl. 33-139.000.

Nakajima, Akihiro: *See—*
Ban, Itsuki; and Nakajima, Akihiro, 4,612,486, Cl. 318-254.000.

Nakajima, Nobuyuki: *See—*
Shimazaki, Yoshikazu; Shimizu, Suekichi; and Nakajima, Nobuyuki, 4,612,243, Cl. 428-321.300.

Nakamura, Kazuharu; Mito, Yoshio; and Takeuchi, Kazuhiko, to Toyotomi Kogyo Co., Ltd. Protective guard for oil burner. 4,611,574, Cl. 126-201.000.

Nakamura, Kazutaka: *See—*
Mandai, Haruhumi; Nakamura, Kazutaka; Naito, Yasuyuki; and Iwai, Kiyoshi, 4,612,140, Cl. 252-520.000.

Nakamura, Koichi. Driving time alarm for vehicle. 4,612,655, Cl. 377-16.000.

Nakamura, Noboru: *See—*
Miyazaki, Masaaki; Ishii, Mitsuaki; Kako, Hajime; Nakamura, Noboru; and Kakinuma, Hideo, 4,611,560, Cl. 123-339.000.

Nakamura, Takeshi; Ando, Kenji; and Matsumoto, Ikuo, to Murata Manufacturing Co., Ltd. Piezoelectric vibrator. 4,612,471, Cl. 310-321.000.

Nakamura, Teruo: *See—*
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,611,977, Cl. 418-76.000.

Nakamura, Tetsuo: *See—*
Morita, Hideo; Abiko, Kenji; and Nakamura, Tetsuo, 4,611,403, Cl. 33-169.00R.

Nakanishi, Yasuji: *See—*
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Nakano, Fumio: *See*—
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, 4,612,127, Cl. 252-32.500.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,612,128, Cl. 252-32.500.

Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, to Toyota Jidosha Kabushiki Kaisha. Method and system for internal combustion engine oxygen sensor heating control which provide sensor heating limited for reliable operation. 4,611,562, Cl. 123-440.000.

Nakano, Yoshihito: *See*—
Matsui, Kazuhiro; Wada, Hideo; Nakano, Yoshihito; and Hayashi, Toshihiro, 4,611,868, Cl. 339-59.00M.

Nakao, Sho: *See*—
Minami, Akira; Nakao, Sho; and Nakayama, Takao, 4,611,409, Cl. 34-9.000.

Nakayama, Takao: *See*—
Minami, Akira; Nakao, Sho; and Nakayama, Takao, 4,611,409, Cl. 34-9.000.

Nalco Chemical Company: *See*—
Keiser, Bruce A., 4,612,138, Cl. 252-313.200.

Nanda, Vinod K.; and Taylor, Henry D., to Vickers, Incorporated. Power transmission. 4,611,528, Cl. 91-442.000.

Nannig, Urban R.: *See*—
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,612,075, Cl. 156-242.000.

Nannini, Luciano: *See*—
Aiuola, Franco; and Nannini, Luciano, 4,611,455, Cl. 53-373.000.

Naohara, Michikazu: *See*—
Nishikawa, Masao; and Naohara, Michikazu, 4,611,733, Cl. 223-75.000.

Naples, John O.: *See*—
Bigwood, Michael P.; and Naples, John O., 4,612,288, Cl. 435-180.000.

Narahara, Toshikazu: *See*—
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, 4,612,127, Cl. 252-32.500.

Nardi, Franco, to Sunds Defibrator AB. Reactor to perform chemical reactions with a disintegrating disc. 4,612,088, Cl. 162-235.000.

Nash, Donald R., to Allied Corporation. Capacitive discharge magneto ignition system. 4,611,570, Cl. 123-601.000.

Nassof, Martin, to Simplex Ceiling Corp. Sanitary acoustical ceiling. 4,611,444, Cl. 52-145.000.

National Controls, Inc.: *See*—
Yu, George T., 4,611,677, Cl. 177-187.000.

Natsuhara, Masao: *See*—
Ashizaki, Shigeya; Natsuhara, Masao; Sugahara, Koichi; and Muranishi, Hideo, 4,612,474, Cl. 313-414.000.

Navistar International Corporation: *See*—
Sullivan, John T., 4,611,847, Cl. 296-1.00S.

Nazmy, Mohamed Y.; Rydstad, Hans; Schroder, Gunther; and Singer, Robert, to BBC Brown, Boveri & Company, Ltd. Process for producing a fine-grained workpiece from a nickel-based superalloy. 4,612,062, Cl. 148-11.50N.

Nebel, Raoul: *See*—
Dousse, Roland; and Nebel, Raoul, 4,612,395, Cl. 564-245.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Glassware forming machine with parison catching device. 4,612,032, Cl. 65-165.000.

NEC Corporation: *See*—
Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, 4,611,867, Cl. 339-14.00R.
Itoh, Shin-ichi, 4,612,547, Cl. 343-372.000.
Watari, Toshihiko, 4,612,601, Cl. 361-387.000.
Yasumoto, Masaaki; Hayama, Hiroshi; and Enomoto, Tadayoshi, 4,612,083, Cl. 156-633.000.

NEC Corporation and Clarion Co., Ltd.: *See*—
Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,612,662, Cl. 381-10.000.

NEC Home Electronics Ltd: *See*—
Fujiwara, Shinsuke, 4,611,939, Cl. 400-637.000.

Neri, Armando, to G.D. Societa Per Azioni. System for monitoring the operation of input circuits to a central control and monitoring unit for machines and/or devices usable in production and/or product packaging lines. 4,612,445, Cl. 250-551.000.

Nesler, John J.: *See*—
Farnsworth, Robert P.; and Nesler, John J., 4,612,610, Cl. 363-26.000.

Nestec S. A.: *See*—
Postner, Hermann, 4,612,197, Cl. 426-47.000.

Neuenschwander, Kent W.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Neuenschwander, Kent W., 4,612,309, Cl. 514-212.000.

Neuhauser, Hans J.; Buran, Ulrich; and Fischer, Manfred, to Goetze AG. Wear-resistant coating. 4,612,256, Cl. 428-547.000.

Neumann, Walter. Liquid filter. 4,612,117, Cl. 210-393.000.

Newman, Ray L.; Hoffman, Theodore H.; Dorazio, Raymond E.; Ferri, John L.; Gonzalez, Jeffrey M.; and Fulkerson, William C., to GTE Products Corporation. Temperature compensator for pressure operated fuel regulator. 4,611,984, Cl. 431-19.000.

Newman, Robert D. Fireplace grate kit and grate. 4,611,573, Cl. 126-153.000.

Newton, Milton A., Jr. Starting block assembly. 4,611,803, Cl. 272-105.000.

Nguyen-van-Nguyen, Jean: *See*—
Defeuilley, Jean-Pierre; and Nguyen-van-Nguyen, Jean, 4,612,516, Cl. 331-11.000.

Nicco, Adrien; Hubert, Jerome; Druz, Jacques; and Lambla, Morand, to Societe Chimique des Charbonnages S.A. Process for crosslinking ethylene polymers containing anhydride functions, crosslinkable polymer compositions and the application of these compositions to the coating of substrates. 4,612,349, Cl. 525-117.000.

Nicholson, Joseph M.: *See*—
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.

Nickeson, James L.; and Walko, John A., to Concord, Inc. Conservation no till farming apparatus. 4,611,545, Cl. 111-52.000.

Nicoloso, Dante, to Alsthom. Compressed gas circuit breaker able to be assembled and disassembled without a significant loss of gas. 4,612,428, Cl. 200-148.00R.

Niedermayr, Erich: *See*—
Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, 4,611,843, Cl. 294-86.400.

Niekamp, Carl W.: *See*—
Pickens, Carl E.; and Niekamp, Carl W., 4,612,284, Cl. 435-96.000.

Nielsen, Elgard: *See*—
Lund, Arne; Nowakowski, Egon; Nielsen, Elgard; and Nielsen, Per G., 4,611,432, Cl. 49-192.000.

Nielsen, Per G.: *See*—
Lund, Arne; Nowakowski, Egon; Nielsen, Elgard; and Nielsen, Per G., 4,611,432, Cl. 49-192.000.

Niemann, Gary O. Method and apparatus for packing fruit. 4,611,706, Cl. 198-443.000.

Nieuwendijk, Joris A. M.; and Van Gijsel, Wilhelmus D. A. M., to U.S. Philips Corporation. Loudspeaker system for converting a digitized electric signal into an acoustic signal. 4,612,420, Cl. 179-115.5PV.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; and Tamura, Tatsuo, 4,612,385, Cl. 560-12.000.

Niigata Engineering Co., Ltd.: *See*—
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,611,549, Cl. 114-144.00E.

Niles, Paul D.: *See*—
Petersen, Carl C.; Normann, Richard W.; and Niles, Paul D., 4,611,880, Cl. 339-206.00R.

Nilssen, Ole K. Incandescent lamp with dichroic trihedral corner reflectors. 4,612,473, Cl. 313-111.000.

Nilsson, John L. G.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

Ninomiya, Hiroyuki: *See*—
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.

Nippon Electric Co., Ltd.: *See*—
Yamazaki, Yuetsu, 4,612,453, Cl. 307-303.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Fujino, Yoshihiro; and Kurahashi, Kazuo, 4,611,371, Cl. 29-20.000.
Hideo, Suzuki, 4,611,522, Cl. 84-1.010.

Nippon Kogaku K. K.: *See*—
Hara, Masahara; and Dobashi, Toshio, 4,611,897, Cl. 354-475.000.

Nippon Kogaku K.K.: *See*—
Kadomatsu, Yuji, 4,611,911, Cl. 356-5.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Nishio, Hiroaki; Ueno, Yasushi; and Harada, Jun, 4,612,163, Cl. 419-68.000.

Nippon Piston Ring Co., Ltd.: *See*—
Kumagai, Atsushi; Tanabe, Tsutomu; and Yasunaga, Hirokazu, 4,612,260, Cl. 428-667.000.

Nippon Steel Corporation: *See*—
Omata, Hiroyasu; Ito, Satoshi; and Murata, Tomomi, 4,612,095, Cl. 204-144.500.

Nippon Thompson Co., Ltd.: *See*—
Haruyama, Akira, 4,611,861, Cl. 384-49.000.

Nippon Unicar Co. Limited: *See*—
Kawasaki, Youichi; and Igarashi, Kenji, 4,612,139, Cl. 252-511.000.

Nippondenso Co., Ltd.: *See*—
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.
Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,611,815, Cl. 280-6.00R.

Nishibe, Takashi: *See*—
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.

Nishida, Shigeki; and Ikeura, Hiroo, to Noritsu Kenkya Center Co., Ltd. Method of determining the optimum exposure conditions for a color printer. 4,611,918, Cl. 356-404.000.

Nishikawa, Masao; and Naohara, Michikazu, to Takatori Machinery Mfg. Co., Ltd. Apparatus for automatically relocating the stocking toe part correctly on the setting frame. 4,611,733, Cl. 223-75.000.

Nishino, Hiroyuki: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.

Nishio, Hiroaki; Ueno, Yasushi; and Harada, Jun, to Nippon Kokan Kabushiki Kaisha. Method of molding powders of metal, ceramic and the like. 4,612,163, Cl. 419-68.000.

Nishiyama, Kazuo; Mishima, Yasuhiro; and Kuwayama, Kiyoaki, to Toyota Jidosha Kabushiki Kaisha; and Chuohatsujyo Kabushiki Kaisha. Leaf spring assembly for wheel suspension. 4,611,793, Cl. 267-52.000.
Nishiyama, Tadashi: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.
Nishizako, Shizutaka: *See—*
Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, 4,612,427, Cl. 200-144.00R.
Nissan Motor Company, Limited: *See—*
Abe, Kazuyoshi; Kawasaki, Masahiko; Yazaki, Kazuhiko; and Sekine, Yoshitada, 4,611,380, Cl. 29-430.000.
Matumura, Hideki, 4,611,638, Cl. 139-304.000.
Murakami, Terukiyo, 4,612,615, Cl. 364-431.070.
Ohashi, Toshio, 4,611,756, Cl. 236-49.000.
Segoshi, Toru; and Mutoh, Masakazu, 4,612,607, Cl. 362-267.000.
Takeuchi, Kiyoshi, 4,611,490, Cl. 73-505.000.
Nisshin Chemicals Co., Ltd.: *See—*
Iijima, Takeo; and Sano, Hiroyuki, 4,612,187, Cl. 424-16.000.
Nisshin Steel Company, Ltd.: *See—*
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.
Nitto Electric Industrial Co., Ltd.: *See—*
Kamiyama, Yoshiyasu; and Nakagome, Keisuke, 4,612,118, Cl. 210-490.000.
Nixon, Michael T. Three-function acoustical panel. 4,611,687, Cl. 181-286.000.
NL Industries, Inc.: *See—*
Dillon, Edward T.; and Edmonds, David L., 4,612,109, Cl. 208-131.000.
Noguchi, Takeshi: *See—*
Ushijima, Takao; and Noguchi, Takeshi, 4,611,782, Cl. 248-562.000.
Nomicos, Konstantine D.: *See—*
Varotsos, Panayiotis A.; Alexopoulos, Kessar D.; and Nomicos, Konstantine D., 4,612,506, Cl. 324-348.000.
Nomura, Yasushi: *See—*
Furuta, Yoshiteru; and Nomura, Yasushi, 4,612,289, Cl. 436-34.000.
Nomura, Yoshihisa: *See—*
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.
Nordica S.p.A.: *See—*
Tonel, Valerio, 4,611,415, Cl. 36-120.000.
Nordiskafilt AB: *See—*
Bugge, Hans J., 4,611,639, Cl. 139-383.00A.
Nordson Corporation: *See—*
Turner, James J.; and Waryu, Joseph C., 4,611,762, Cl. 239-708.000.
Norigoe, Takashi, to Tokyo Electric Co., Ltd. Process for producing a dot printer head. 4,611,393, Cl. 29-602.00R.
Noritsu Kenkya Center Co., Ltd.: *See—*
Nishida, Shigeki; and Ikeura, Hiroo, 4,611,918, Cl. 356-404.000.
Normann, Richard W.: *See—*
Petersen, Carl C.; Normann, Richard W.; and Niles, Paul D., 4,611,880, Cl. 339-206.00R.
Norris, Alan J., to Imperial Chemical Industries, PLC. Electrostatic spraying apparatus. 4,612,598, Cl. 361-227.000.
Northern Telecom Limited: *See—*
Giles, Clinton R., 4,612,671, Cl. 455-609.000.
Grover, Wayne D.; and Lefebvre, Martin C., 4,612,636, Cl. 370-94.000.
Northrop Corporation: *See—*
Long, William H.; Stappaerts, Eddy A.; and Plummer, Michael J., 4,612,643, Cl. 372-38.000.
Northwest Podiatric Laboratories, Inc.: *See—*
Brown, Dennis N., 4,611,413, Cl. 36-44.000.
Northwestern University: *See—*
Grayhack, John T.; and Benderev, Theodore V., 4,611,594, Cl. 128-328.000.
Norvell, Gordon S., to Litton Systems, Inc. High performance laser and method of making same. 4,612,647, Cl. 372-88.000.
Nossen, Edward J., to RCA Corporation. Antenna matching system. 4,612,669, Cl. 455-123.000.
Novakovic, Mario; and Abend, Phillip G., to Finetex, Inc. Surfactant compositions and related processes and procedures. 4,612,136, Cl. 252-134.000.
November, Daniel: *See—*
Kromer, Heiner M.; and November, Daniel, 4,612,106, Cl. 204-299.00R.
Nowakowski, Egon: *See—*
Lund, Arne; Nowakowski, Egon; Nielsen, Elgard; and Nielsen, Per G., 4,611,432, Cl. 49-192.000.
Noyes, Howard B.; and Aelion, Rene, to Tecseat Ltd. Pneumatic bicycle saddle. 4,611,851, Cl. 297-199.000.
Nozaki, Chikateru: *See—*
Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, 4,612,283, Cl. 435-68.000.
Nukem GmbH: *See—*
Hewig, Gert; Huschka, Hans; Schurich, Bernd; and Worner, Jorg, 4,612,410, Cl. 136-256.000.
Nuti, Marianna: *See—*
Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,612,282, Cl. 435-68.000.
Nutt, Ruth F., to Merck & Co., Inc. Cyclic hexapeptide somatostatin analogs. 4,612,366, Cl. 530-311.000.
Nuttin, Pierre. Process and installation for the production of documentation. 4,611,799, Cl. 270-52.500.
Nuzzo, Ralph G.: *See—*
Dubois, Lawrence H.; and Nuzzo, Ralph G., 4,612,407, Cl. 585-434.000.
O.G. Hoyer A/S: *See—*
Degn, Kaj H., 4,611,468, Cl. 62-71.000.
Obana, Hiroshi: *See—*
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.
Obara, Takeshi; Gotou, Toshirou; and Kobayashi, Kazuyuki, to Kabushiki Kaisha Sato. Rolled thermal transfer carbon ribbon structure with lead tape. 4,612,232, Cl. 428-172.000.
Oberstrass, Detlev, to Barmag Barmer Maschinenfabrik AG. Yarn winding apparatus with doffing means. 4,611,767, Cl. 242-18.0DD.
Obie, John P.; and Faudree, Thomas L., to Chicagoland Processing Corp. Apparatus for continuously treating solids with liquids. 4,611,612, Cl. 134-65.000.
Occidental Chemical Corporation: *See—*
Ginter, James W.; Thorpe, Donald H.; and Cooke, Victor F. G., 4,612,254, Cl. 428-531.000.
Occidental Oil Shale, Inc.: *See—*
Cha, Chang Y.; and Ricketts, Thomas E., 4,611,856, Cl. 299-2.000.
Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Static type semiconductor memory circuit. 4,612,631, Cl. 365-203.000.
Oda, Yasuhiro: *See—*
Okuzono, Shuichi; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,612,343, Cl. 524-547.000.
O'Donnell & Associates, Inc.: *See—*
O'Donnell, William J.; and Porowski, Jan S., 4,612,071, Cl. 148-131.000.
O'Donnell, William J.; and Porowski, Jan S., to O'Donnell & Associates, Inc. Mechanical stress improvement process. 4,612,071, Cl. 148-131.000.
Ogasawara, Hiromichi: *See—*
Kaneko, Chikara; Sato, Masayuki; and Ogasawara, Hiromichi, 4,612,379, Cl. 549-274.000.
Ogata, Masaru; Matsumoto, Hiroshi; Kida, Shiro; and Tawara, Katsuya, to Shionogi & Co., Ltd. Azole type dioxolane derivatives. 4,612,322, Cl. 514-383.000.
Ogawa, Nobuo: *See—*
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.
Ogita, Yasunori: *See—*
Yanagishita, Masami; and Ogita, Yasunori, 4,611,679, Cl. 180-68.300.
Ogura, Masahiko; and Oushiden, Hideshi, to Kabushiki Kaisha Toshiba. Magnification selectable image forming apparatus. 4,611,909, Cl. 355-56.000.
Ohachi, Yoshinori. Medical device. 4,612,340, Cl. 524-296.000.
Ohashi, Kazuo, to Kabushiki Kaisha Patine Shokai. Ice making apparatus particularly for an ice rink. 4,611,471, Cl. 62-235.000.
Ohashi, Toshio, to Nissan Motor Co., Ltd. Controller for fan motor of air conditioner. 4,611,756, Cl. 236-49.000.
Ohkawa, Michihisa; and Kobayashi, Hideo, to Kokusai Denshin Denwa Co., Ltd. PLL having phase comparator with hysteresis characteristics. 4,612,515, Cl. 331-1.00A.
Ohnishi, Masanobu: *See—*
Matsuoka, Mitsuyuki; and Ohnishi, Masanobu, 4,611,832, Cl. 285-55.000.
Ohnishi, Yoshiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transmission system having high-speed transmission procedures. 4,612,541, Cl. 340-825.050.
Ohno, Susumu: *See—*
Kondo, Tadashige; and Ohno, Susumu, 4,611,569, Cl. 123-600.000.
Ohno, Takao: *See—*
Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, 4,612,148, Cl. 264-49.000.
Ohsato, Kiyoshi, to Sony Corporation. Focussing error detecting apparatus for use in an optical disc reproducing device, an auto-focus camera or image-pickup device. 4,612,437, Cl. 250-201.000.
Ohtake, Yasuhisa: *See—*
Suzuki, Fumio; Fujinuma, Makoto; Ohtake, Yasuhisa; and Inaba, Michihiko, 4,612,061, Cl. 148-6.350.
Ohtomo, Nobuya: *See—*
Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, 4,612,283, Cl. 435-68.000.
Ohura, Jun-ichi: *See—*
Motojima, Hideaki; Takayama, Hiroki; and Ohura, Jun-ichi, 4,612,562, Cl. 357-38.000.
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, to Honda Giken Koygo K.K. Hydraulic servomechanism. 4,612,003, Cl. 474-28.000.
Ohzono, Kohei: *See—*
Hayashi, Kiyotaka; Ohzono, Kohei; and Yakigaya, Nobuyuki, 4,612,002, Cl. 474-28.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Tape pad for use in magnetic recording tape cassette. 4,612,593, Cl. 360-130.310.
Oka, Hiroyuki: *See—*
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.

Okada, Toshihiko, to Oki Electric Industry Co., Ltd. Reading and writing apparatus for ID cards. 4,612,436, Cl. 235-449.000.

Okado, Hiroyuki: *See—*
Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, 4,612,427, Cl. 200-144.00R.

Okamoto, Akihiro: *See—*
Maeda, Tetsuro; Onaya, Kyoji; and Okamoto, Akihiro, 4,612,253, Cl. 428-521.000.

Okamoto, Kiyohide: *See—*
Okita, Ryosuke; and Okamoto, Kiyohide, 4,611,697, Cl. 192-21.500.

Okamoto, Rokuro: *See—*
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.

Okamura, Hisashi; and Kawamoto, Hiroshi, to Fuji Photo Film Co., Ltd. Hardened gelatin and method for hardening gelatin. 4,612,280, Cl. 430-621.000.

Okano, Hiroyuki: *See—*
Koizumi, Masaaki; Fukada, Nobuo; and Okano, Hiroyuki, 4,612,040, Cl. 75-10.650.

Okazaki, Masaki: *See—*
Genba, Tsuneo; Mizobe, Akio; Okazaki, Masaki; and Sakuragi, Isao, 4,612,157, Cl. 264-185.000.

Oki Electric Industry Co., Ltd.: *See—*
Okada, Toshihiko, 4,612,436, Cl. 235-449.000.

Okita, Ryosuke; and Okamoto, Kiyohide, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic powder coupling with cooling fins. 4,611,697, Cl. 192-21.500.

Okutu, Toshimitu: *See—*
Ushimaru, Akira; Fujiyama, Masaaki; Okutu, Toshimitu; and Miyoshi, Takahito, 4,612,235, Cl. 428-216.000.

Okuzono, Shuichi; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, to Toya Soda Manufacturing Co., Ltd. Colored polymer emulsion and process for preparation thereof. 4,612,343, Cl. 524-547.000.

Oleck, Stephen M.: *See—*
Angevine, Philip J.; Mitchell, Kenneth M.; Oleck, Stephen M.; and Shih, Stuart S., 4,612,108, Cl. 208-111.000.

Olin Corporation: *See—*
Brock, Andrew J.; Smith, Edward F.; and Shapiro, Eugene, 4,612,166, Cl. 420-470.000.
Winter, Joseph; and Pryor, Michael J., 4,611,748, Cl. 228-170.000.

Oliver, Bruce J.: *See—*
Thomsen, Jack W., 4,611,788, Cl. 251-363.000.

Olofson, Roy A.: *See—*
Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., 4,612,143, Cl. 558-282.000.

Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, to SKF Kugellagerfabriken GmbH. Bearing bushing for universal joints. 4,611,932, Cl. 384-481.000.

Olsen, David K.: *See—*
DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., 4,611,659, Cl. 166-274.000.

Olsen, Leif: *See—*
Bruff, William V. H.; and Olsen, Leif, 4,612,151, Cl. 264-105.000.

Olson, Anthony M., to Zenith Electronics Corporation. Power transition write protection for PROM. 4,612,632, Cl. 365-226.000.

Olympus Optical Co., Ltd: *See—*
Rokutan, Takao, 4,612,508, Cl. 329-50.000.

Omata, Hiroyasu; Ito, Satoshi; and Murata, Tomomi, to Nippon Steel Corporation. Method for improving corrosion resistance of bright annealed stainless steel. 4,612,095, Cl. 204-144.500.

Omco Inc.: *See—*
Carlson, John H.; and Agbay, Anthony J., 4,611,478, Cl. 70-164.000.

Omega SA: *See—*
Vuilleumier, Cyril; and Erni, Bruno, 4,611,925, Cl. 368-28.000.

Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, to Kuraray Co., Ltd. Phosphate monoester adhesive composition. 4,612,384, Cl. 558-198.000.

On, Harry P., Jr.: *See—*
Landry, James F.; Croudace, Michael C.; On, Harry P., Jr.; and Shen, Sidney Y., 4,612,130, Cl. 252-39.000.

Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with by-pass control system for supercharger. 4,611,568, Cl. 123-559.000.

Onaya, Kyoji: *See—*
Maeda, Tetsuro; Onaya, Kyoji; and Okamoto, Akihiro, 4,612,253, Cl. 428-521.000.

Onder, Kemal: *See—*
Andrews, Philip S.; and Onder, Kemal, 4,612,353, Cl. 525-432.000.

Ono, Takuhiro: *See—*
Miyata, Takeo; Ono, Takuhiro; and Iwabuchi, Takashi, 4,612,234, Cl. 428-215.000.

Onoda Cement Co., Ltd.: *See—*
Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, 4,611,765, Cl. 241-121.000.

Oohashi, Kaoru: *See—*
Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,611,815, Cl. 280-6.00R.

Ooishi, Tadashi, to Sumitomo Chemical Company, Limited. Controlling agent for wood rotting fungi. 4,612,307, Cl. 514-147.000.

Ooka, Naoto: *See—*
Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,611,815, Cl. 280-6.00R.

Oomatsu, Yoshiya: *See—*
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.

Orbach, Peter, to Kampf GmbH & Co. Maschinenfabrik, Firma. Slitting and rewinding machine. 4,611,769, Cl. 242-56.900.

Orcutt, Donald R., to Babcock & Wilcox Company, The. Insulating and slag inducing composition and method for molten metal contact. 4,612,046, Cl. 75-96.000.

Orehoski, Michael A.: *See—*
Gray, Ronald D.; and Orehoski, Michael A., 4,612,043, Cl. 75-49.000.

Orlandea, Nicolae V.: *See—*
Wohlford, William P.; and Orlandea, Nicolae V., 4,611,860, Cl. 305-43.000.

Orosz, Miklos J.: *See—*
Clark, Michael R.; Tringali, Dominick; Woodlief, Fredrick E.; and Orosz, Miklos J., 4,612,424, Cl. 200-50.00A.

Orr, Larry W., to Paccar Inc. Aerodynamic retarder. 4,611,796, Cl. 296-1.00S.

Ort, Morris R., to Monsanto Company. Melt polymerization process for preparing polyarylates. 4,612,360, Cl. 528-182.000.

Osaka University: *See—*
Mori, Hirotaro; and Fujita, Hiroshi, 4,612,059, Cl. 148-4.000.

Osawa, Michitaka: *See—*
Maekawa, Hitoshi; Osawa, Michitaka; and Ando, Kunio, 4,612,451, Cl. 307-270.000.

Osawa, Shigenobu: *See—*
Kohyama, Mitsuaki; Kasai, Toshihiro; Ishida, Haruhiko; and Osawa, Shigenobu, 4,611,901, Cl. 355-4.000.

Osborne, Robert; and Bailey, Kevin D., to Imperial Chemical Industries PLC. Preparation of 2-chloro-5-methylpyridine. 4,612,377, Cl. 546-345.000.

Osswald, Hartmut: *See—*
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.

Oster, Walter: *See—*
Uhlemann, Reinhard; and Oster, Walter, 4,612,488, Cl. 318-582.000.

Osterhoudt, M. Glenn, III; and Green, Vernon L., to Petro-Stix, Inc. Technique for placing a liquid chemical in a well or bore hole. 4,611,664, Cl. 166-902.000.

Ostrow, Robert L., to Label-Aire, Inc. Label applicator with pivotable labeling head. 4,612,079, Cl. 156-497.000.

Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, to Showa Aluminum Corporation. Device for releasing and diffusing bubbles into liquid. 4,611,790, Cl. 266-235.000.

Otsuka, Shigeharu: *See—*
Mori, Teijiro; Okado, Hiroyuki; Nishizako, Shizutaka; Otsuka, Shigeharu; and Masuda, Shigeru, 4,612,427, Cl. 200-144.00R.

Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Anti-skid braking apparatus for vehicles. 4,611,859, Cl. 303-100.000.

Ott, Karl-Heinz: *See—*
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,612,347, Cl. 525-73.000.

Oushiden, Hideshi: *See—*
Ogura, Masahiko; and Oushiden, Hideshi, 4,611,909, Cl. 355-56.000.

Outokumpu Oy: *See—*
Kallioinen, Jouko O., 4,612,113, Cl. 209-170.000.

Owens-Corning Fiberglas: *See—*
Marra, Jerome F., 4,612,027, Cl. 65-1.000.

Owens, Henry S., to Vetco Offshore Industries, Inc. TLP tendon bottom connector. 4,611,953, Cl. 405-224.000.

Oyamada, Takashi: *See—*
Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, 4,612,418, Cl. 179-81.00R.

Oyobe, Masaaki; Ichikawa, Hiromichi; and Maeyama, Tsutomu, to Lion Corporation. Dentifrice composition. 4,612,189, Cl. 424-49.000.

P & B Industries: *See—*
Birdwell, J. C., 4,611,973, Cl. 417-342.000.

Paccar Inc.: *See—*
Orr, Larry W., 4,611,796, Cl. 296-1.00S.

Pace, Salvatore J.: *See—*
Bock, Jan; Downs, Hartley H.; Siano, Donald B.; and Pace, Salvatore J., 4,612,332, Cl. 521-65.000.

Pack Image, Inc.: *See—*
Stone, Orison W., 4,611,712, Cl. 206-198.000.

Packer, Marvin; and Fritz, John X., to RCA Corporation. Bonding polyurethanes to polyolefins. 4,612,249, Cl. 428-424.800.

Pallagi, Steven: *See—*
Schmidt, Erick; Grenier, Leonard E.; and Pallagi, Steven, 4,611,881, Cl. 350-6.900.

Palmer, Murray H.: *See—*
Bland, Sarah E. L.; and Palmer, Murray H., 4,612,021, Cl. 55-53.000.

Palmer, Robert L., to Ainsworth Nominees Pty. Limited. Statistical information gathering. 4,611,808, Cl. 273-138.00A.

Palo Alto Medical Foundation Research Institute: *See—*
Desmonts, Georges; and Remington, Jack S., 4,612,281, Cl. 435-7.000.

Pampalone, Thomas R.; and Holder, Paula M., to RCA Corporation. Two-layer negative resist. 4,612,270, Cl. 430-273.000.

Pande, Krishna P., to Allied Corporation. Method of forming an indium phosphide-boron phosphide heterojunction bipolar transistor. 4,611,388, Cl. 29-576.00E.

Panick, Karl, to Webasto-Werk W. Baier GmbH & Co. Vaporization burner. 4,611,985, Cl. 431-240.000.

Pantry, William J.; and Baumann, Burke B., to Honeywell Inc. Apparatus for arbitrating between a plurality of requestor elements. 4,612,542, Cl. 340-825.500.

Papenfuhs, Theodor: *See*—
Koller, Wolfgang; and Papenfuhs, Theodor, 4,612,396, Cl. 564-441.000.

Papp, Janos: *See*—
Harsanyi, Jozsef; and Papp, Janos, 4,611,764, Cl. 241-39.000.

Paradyne Corporation: *See*—
Betts, William L.; Smith, Wesley H.; and Deakley, Michael R., 4,612,509, Cl. 329-50.000.

Pardes, Herman; and Mills, William J., to United States of America, Army. Moving object detection system using infrared scanning. 4,612,441, Cl. 250-342.000.

Parker, Alan, to Hollingsworth (U.K.) Ltd. Treatment of fibrous materials. 4,611,366, Cl. 19-236.000.

Parker Chemical Company: *See*—
Kojima, Ryuiji; Suzuki, Naomi; Sato, Yokichi; and Saito, Tsuneo, 4,612,060, Cl. 148-6.15Z.

Parker Hannifin Corporation: *See*—
Wang, Hsien B., 4,611,620, Cl. 137-100.000.

Parker, James D. Lawn mower blade with replaceable cutter. 4,611,460, Cl. 56-295.000.

Parker, Phillip H., to Chevron Research Company. Bis(hydroxyphenyl)fluorene polyarylate polymers and alloys. 4,612,350, Cl. 525-177.000.

Parsons, Michael H.; and McGlen, James A., to Eastman Kodak Company. Sheet separator apparatus for recirculating feeder. 4,611,800, Cl. 271-3.100.

Partin, Dale L., to General Motors Corporation. Lead-alloy-telluride heterojunction semiconductor laser. 4,612,644, Cl. 372-44.000.

Pasteris, Robert J.: *See*—
Brown, Hugh M.; and Pasteris, Robert J., 4,612,035, Cl. 71-90.000.

Pasternack, Adalbert, to Dragerwerk AG. Device for regenerating respiratory breathing air. 4,611,589, Cl. 128-202.260.

Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Attenuator valve for a pressure-gas conduit. 4,611,628, Cl. 137-509.000.

Pastor, Stephen D.: *See*—
Spivack, John D.; and Pastor, Stephen D., 4,612,341, Cl. 524-331.000.

Pastusek, Paul E.: *See*—
Childers, John S.; Pastusek, Paul E.; and Schumacher, Percy W., Jr., 4,611,673, Cl. 175-340.000.

Patalong, Hubert, to Siemens Aktiengesellschaft. Thyristor having a secondary emitter electrode and a method for operating the same. 4,612,449, Cl. 307-252.00C.

Patel, Gita D.: *See*—
Khan, Riaz A.; Mufti, Khisar S.; and Patel, Gita D., 4,612,373, Cl. 536-120.000.

Patel, Jitendra A., to Texaco Inc. Debridging apparatus. 4,611,921, Cl. 366-156.000.

Pathuis, Jan W.: *See*—
Kleefstra, Marcus; Montagne, Antonius J. M.; and Pathuis, Jan W., 4,612,521, Cl. 333-165.000.

Patterson, Michael, to ASE (UK) Limited. Adjustable anchorage. 4,611,825, Cl. 280-808.000.

Payne, Peter P., to Honeywell Inc. Air conserving restriction for use in pneumatic systems. 4,611,619, Cl. 137-82.000.

Payne, Stephen C. Dimmer circuit for high intensity discharge lamp. 4,612,478, Cl. 315-176.000.

Peabody Coal Company: *See*—
Gill, Ronald P.; and Evans, Vernon C., 4,612,595, Cl. 361-93.000.

Pedersen, Egon A., to Qume Corporation. Paper feeder. 4,611,802, Cl. 271-274.000.

Pedersen, Larry D.: *See*—
DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., 4,611,659, Cl. 166-274.000.

Peitz, Wolfgang, to Westfalische Metall Industrie KG Hueck & Co. Dimmed vehicle headlight. 4,612,608, Cl. 362-297.000.

Pelata, Kenneth L.: *See*—
Muchow, John D.; and Pelata, Kenneth L., 4,611,630, Cl. 137-625.370.

Pelc, Norbert J., to General Electric Company. Method for removing the effects of baseline error components in NMR imaging applications. 4,612,504, Cl. 324-309.000.

Pellet, Regis J.: *See*—
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,612,406, Cl. 585-329.000.

Pennsylvania Engineering Corporation: *See*—
Gray, Ronald D.; and Orehoski, Michael A., 4,612,043, Cl. 75-49.000.

Pentel Kabushiki Kaisha: *See*—
Nagaoka, Makoto; and Sugiyama, Tetsuya, 4,612,433, Cl. 219-216.000.

Penzel, Erich: *See*—
Bott, Kaspar; Penzel, Erich; and Eckert, Guenter, 4,612,392, Cl. 564-207.000.

Peppler, Dennis L.; Zaman, Mohammad F.; Bornstein, Norman S.; and Hartz, Marvin E., to Essex Group, Inc. Method for producing continuous length high solids enamel coated magnet wire. 4,611,747, Cl. 228-125.000.

Perchthaler, Heinz: *See*—
Eustacchio, Peter; Perchthaler, Heinz; and Syrowatka, Rupert, 4,612,123, Cl. 210-709.000.

Perkin-Elmer Corporation, The: *See*—
Tracy, David H.; and Smith, Donald L., 4,612,077, Cl. 156-345.000.

Perkins, Donald W.: *See*—
Geyer, Bernard H., Jr.; and Perkins, Donald W., 4,612,549, Cl. 343-379.000.

Perlegos, Gust: *See*—
Mehrotra, Sanjay; and Perlegos, Gust, 4,612,640, Cl. 371-51.000.

Perobelli, Aldo: *See*—
Pessina, Giorgio; and Perobelli, Aldo, 4,611,801, Cl. 271-150.000.

Perry, Thomas H., Jr.: *See*—
Davenport, James W.; and Perry, Thomas H., Jr., 4,612,094, Cl. 204-141.500.

Pesa, Frederick A.: *See*—
Currie, Janie K.; Cooper, Arthur J.; and Pesa, Frederick A., 4,612,301, Cl. 502-154.000.

Pessina, Giorgio; and Perobelli, Aldo. Accumulating conveyor device. 4,611,801, Cl. 271-150.000.

Peter, Cornelius: *See*—
Burkel, Rainer; Muller, Alfred; Peter, Cornelius; and Schwab, Manfred, 4,611,507, Cl. 74-866.000.

Peter, Josef, to Ellenberger & Poensgen. Single or multiple pole overload protective circuit breaker having an integrated signal contact point. 4,612,528, Cl. 337-79.000.

Peters, Edward N., to General Electric Company. Poly(etherimides) and compositions containing the same. 4,612,361, Cl. 528-185.000.

Peters, Kenneth R.: *See*—
Watkins, Robert L.; and Peters, Kenneth R., 4,611,724, Cl. 220-5.00A.

Petersen, Carl C.; Normann, Richard W.; and Niles, Paul D., to Allied Corporation. Multipiece electrical connector. 4,611,880, Cl. 339-206.00R.

Peterson, David T.: *See*—
Schmidt, Frederick A.; Peterson, David T.; and Wheelock, John T., 4,612,047, Cl. 420-83.000.

Peterson, Elmer R.: *See*—
Stout, Gregg W.; and Peterson, Elmer R., 4,611,660, Cl. 166-297.000.

Peterson, George W.: *See*—
Geschwender, Robert C., 4,611,684, Cl. 180-223.000.

Peterson, Gerald E.: *See*—
Karliner, Rudolf R.; and Peterson, Gerald E., 4,611,941, Cl. 401-207.000.

Peterson, John F., to Helix Technology Corporation. Method and apparatus for throttling gas flow to a cryopump. 4,611,467, Cl. 62-55.500.

Peterson, Royal D.; and Jones, Ronald E., to Continental Laser Corporation. Modular gas laser end assembly. 4,612,648, Cl. 372-109.000.

Peterson, Steven H.: *See*—
Jackovitz, John F.; and Peterson, Steven H., 4,612,097, Cl. 204-157.200.

Petit, William A., to General Signal Corp. Railway track switch control apparatus. 4,611,775, Cl. 246-28.00F.

Petro-Stix, Inc.: *See*—
Osterhoudt, M. Glenn, III; and Green, Vernon L., 4,611,664, Cl. 166-902.000.

Petrovic, Ljubisa M. Fluid treatment apparatus and method. 4,611,615, Cl. 137-13.000.

Pettersson, Rolf T.; Edlund, Hans G. U.; and Regebro, Bengt I. C., to Affarsverket FFV. Mortar ammunition. 4,611,540, Cl. 102-372.000.

Pettit, John: *See*—
Goris, Gregg A.; and Pettit, John, 4,611,663, Cl. 166-382.000.

Pfeiffer, Robert C., to Allied Corporation. Self-standing seat buckle mount for automotive vehicles. 4,611,854, Cl. 297-468.000.

Pfister GmbH: *See*—
Hafner, Hans W., 4,611,731, Cl. 222-636.000.

Pfizer Hospital Products Group, Inc.: *See*—
Laptewicz, Joseph E., Jr.; and Bauer, Roland, 4,611,588, Cl. 128-132.00R.

Philip Morris Incorporated: *See*—
Edwards, William B., III, 4,612,391, Cl. 562-577.000.

Phillips, Gary M.; and Benjamin, Albert S., to Medtronic, Inc. Filling system for hermetically sealed batteries. 4,611,395, Cl. 29-623.200.

Phillips, Howard C.: *See*—
MacKissinger, William, Jr.; and Phillips, Howard C., 4,611,484, Cl. 72-481.000.

Phillips Petroleum Company: *See*—
Boultinghouse, Harold D., 4,612,248, Cl. 428-419.000.
Hofferber, James A., 4,612,111, Cl. 208-350.000.
Johnson, Marvin M., 4,612,293, Cl. 502-28.000.
Kukes, Simon G.; Davis, Thomas; Efner, Howard F.; Hogan, Robert J.; and Coombs, Daniel M., 4,612,110, Cl. 208-251.00H.

Phillis, Gary L.: *See*—
Falk, Robert A.; and Phillis, Gary L., 4,611,912, Cl. 356-5.000.

Phoenix Newspapers, Inc.: *See*—
Daws, Bryan E., 4,611,865, Cl. 312-114.000.

Piccinini, Renato: *See*—
Aiuola, Franco; and Piccinini, Renato, 4,612,080, Cl. 156-504.000.

Pickens, Carl E.; and Niekamp, Carl W., to A. E. Staley Manufacturing Company. Process for the enzymatic hydrolysis of non-gelatinized granular starch material directly to glucose. 4,612,284, Cl. 435-96.000.

Pierce, Richard A.; and Jernigan, Robert T., to Dow Chemical Company, The. Polyalkylhydrosiloxanes as inorganic silicate stabilizers. 4,612,134, Cl. 252-75.000.

Pierrel, Michel: *See—*
Fort, Pierre; and Pierrel, Michel, 4,611,650, Cl. 164-298.000.
Gourmel, Yves; Pierrel, Michel; and Bellocci, Rio, 4,611,651, Cl. 164-464.000.

Piller, Michael N. Chain saw guide bar extension. 4,611,401, Cl. 30-387.000.

Pillsbury Company, The: *See—*
Wallin, Glenn; Rosenwald, Diane; Citti, James; and Yong, Samuel, 4,612,198, Cl. 426-94.000.

Pinner, Vernon G.; and Richardson, John, to 501 Hollingsworth (UK) Limited. Open-end spinning machines. 4,611,462, Cl. 57-263.000.

Pinot de Moira, Peter, to Wiggins Teape Group Limited, The. Self-contained pressure sensitive copying material and its production. 4,612,556, Cl. 346-215.000.

Pioneer Electronic Corporation: *See—*
Sakane, Ikuo, 4,612,589, Cl. 360-90.000.

Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, to Henkel Kommanditgesellschaft auf Aktien. Ether sulfonates as low-foam wetting agents. 4,612,142, Cl. 252-555.000.

Piotrowski, Tadeusz W.; and Maack, Horst E., to Cincinnati Milacron Inc. Device for preloading bearings. 4,611,934, Cl. 384-517.000.

Pissiotas, Georg: *See—*
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,612,037, Cl. 71-92.000.

Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., to Societe Nationale des Poudres et Explosifs. Process for the preparation of fluoroformates. 4,612,143, Cl. 558-282.000.

Pitney Bowes Inc.: *See—*
Gavronsky, German; and Wologodzew, Leo, 4,611,736, Cl. 226-134.000.

Pivarunas, Anatoly. Personalized towing device. 4,611,542, Cl. 104-173.0ST.

Plante, Robert A., to L. S. Starrett Company, The. Mechanical averaging gauge. 4,611,408, Cl. 33-552.000.

Plantikow, Ulrich: *See—*
Luckow, Herbert; Plantikow, Ulrich; and Grone, Siegfried, 4,611,751, Cl. 228-184.000.

Plavac, Frank: *See—*
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,612,132, Cl. 252-51.50A.

Plessey Overseas Limited: *See—*
Lawton, Rodney J., 4,612,510, Cl. 329-107.000.

Plettner, Horst: *See—*
Kruckewitt, Wilfried; and Plettner, Horst, 4,611,634, Cl. 138-31.000.

Plummer, Michael J.: *See—*
Long, William H.; Stappaerts, Eddy A.; and Plummer, Michael J., 4,612,643, Cl. 372-38.000.

Pneumo Corporation: *See—*
Vanderlaan, Robert D.; and Eiszner, William H., Jr., 4,612,526, Cl. 335-229.000.

Poessinger, Josef: *See—*
Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, 4,611,843, Cl. 294-86.400.

Pohl, Wulf-Dieter; and Krohn, Ernst-Otto, to Messerschmitt-Bolkow-Blohm GmbH. Axially semisymmetrical supersonic air intake for reaction engines, particularly solid fuel ram jet rocket engines. 4,611,616, Cl. 137-15.100.

Poleshuk, Michael, to Xerox Corporation. High density thermal ink jet printhead. 4,612,554, Cl. 346-140.00R.

Polidoro, Roberto, to Sodeco-Saia AG. Roller counting device with zero reset mechanism. 4,612,435, Cl. 235-144.0DM.

Pollachek, Robert G., to RCA Corporation. Programmable buffer selectively settable to operate in different modes. 4,612,459, Cl. 307-468.000.

Pollara, Frank J.; and Liddle, Louis W. Air treatment unit providing a filtration system for removing ethylene oxide from a contaminated environment. 4,612,026, Cl. 55-274.000.

Pollard, Stephen L. Flexible spray wand. 4,611,761, Cl. 239-284.00R.

Pond, John H.: *See—*
Lam, Ken; Pond, John H.; and Wilda, Douglas W., 4,612,227, Cl. 428-137.000.

Pont-a-Mousson S.A.: *See—*
Fort, Pierre; and Pierrel, Michel, 4,611,650, Cl. 164-298.000.
Gourmel, Yves; Pierrel, Michel; and Bellocci, Rio, 4,611,651, Cl. 164-464.000.

Popelier, Maurice A.: *See—*
Hall, James W.; Popelier, Maurice A.; and Leemans, Daniel L., 4,611,605, Cl. 130-23.000.
Hall, James W.; and Popelier, Maurice A., 4,611,606, Cl. 130-23.000.

Porowski, Jan S.: *See—*
O'Donnell, William J.; and Porowski, Jan S., 4,612,071, Cl. 148-131.000.

Positron Gesellschaft fur Anlagen zur Verformung thermoplastischer Massen mbH: *See—*
Halbritter, Wilfried, 4,612,033, Cl. 65-313.000.

Postner, Hermann, to Nestec S. A. Sauce enhancer in tubes. 4,612,197, Cl. 426-47.000.

Pott, Paul G.: *See—*
Wolter, Bernd; and Pott, Paul G., 4,612,101, Cl. 204-224.00M.

Potter & Brumfield, Inc.: *See—*
Bell, Richard E., 4,611,392, Cl. 29-602.00R.

Potter, Richard R.: *See—*
Wieting, Robert D.; and Potter, Richard R., 4,612,411, Cl. 136-265.000.

Poutrait-Morin: *See—*
Brunet, Patrice, 4,611,828, Cl. 285-3.000.

Powderly, Kevin M.: *See—*
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.

Powell, Jack; and Liatsos, Charles E., to TRW Inc. Amplifier circuit packaging construction. 4,612,512, Cl. 330-66.000.

Powell, Rex B.: *See—*
Gibbons, John P.; and Powell, Rex B., 4,611,771, Cl. 244-3.120.

Powell, Roger A. Parabolic trough solar reflector. 4,611,575, Cl. 126-438.000.

Power Climber, Incorporated: *See—*
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,611,787, Cl. 254-267.000.

Power Shaft Engine, Limited Partnership: *See—*
Molignoni, Albert J., 4,611,655, Cl. 165-163.000.

Powers, Ronald S.: *See—*
Baker, Garland A.; and Powers, Ronald S., 4,611,640, Cl. 140-92.300.

Powlan, Roy Y. Device for cutting threads in the walls of the acetabular cavity in humans. 4,611,587, Cl. 128-92.00E.

PPG Industries, Inc.: *See—*
Bennett, Terry A.; Zimmerman, William B.; and Maslanka, Michael B., 4,612,031, Cl. 65-106.000.
Van Gemert, Barry; Lavanish, Jerome M.; and Schwindeman, James A., 4,612,038, Cl. 71-92.000.

Prakken, Bouwe. Device for packing filled bags into boxes. 4,611,458, Cl. 53-537.000.

Prat, Francois: *See—*
Hennechart, Jean-Paul; Bramaud, Bernard; and Prat, Francois, 4,612,215, Cl. 427-19.00R.

Prater, Cordell E., to Texas Instruments Incorporated. Current limiting output buffer for integrated circuit. 4,612,457, Cl. 307-443.000.

Pratt, John M., to International Computers Limited. Digital display system. 4,612,540, Cl. 340-793.000.

Precision Handling Devices Inc.: *See—*
Hubbard, John D.; and Kerivan, Leo J., 4,611,737, Cl. 226-74.000.

Prenovitz, Melvin B.; and Hori, Koichiro, to MP Video, Inc. Coupler for surgical endoscope and video camera. 4,611,888, Cl. 350-96.220.

Pressacco, Sylvia: *See—*
Sanjurjo, Angel; and Pressacco, Sylvia, 4,612,179, Cl. 423-348.000.

Pressley, James O., to Armstrong World Industries, Inc. Sag-resistant ceiling panel. 4,611,445, Cl. 52-144.000.

Prevorsek, Dusan C.: *See—*
Lai, Yu-Chin; DeBona, Bruce T.; and Prevorsek, Dusan C., 4,612,362, Cl. 528-190.000.

Priore, Mary. Motivational teaching aid for behavior modification. 4,611,997, Cl. 434-236.000.

Pritchard, Dalton H., to RCA Corporation. Television receiver using non-interlaced scanning format with vertical detail enhancement and motion compensation. 4,612,567, Cl. 358-11.000.

Procter & Gamble Company: *See—*
Kupper, Philip L.; and Shields, Marsha W., 4,612,205, Cl. 426-599.000.
Wong, Vincent Y.; Volker, David A.; Jury, Lydia A.; and Bruno, David J., Jr., 4,612,203, Cl. 426-589.000.

Proepper, Wilhelm, to Benz & Hilgers GmbH. Capping machine. 4,611,454, Cl. 53-307.000.

Profile Systems, Inc.: *See—*
Krechel, Oliver A., 4,611,447, Cl. 52-209.000.

Progress Equities Incorporated: *See—*
Berry, W. Wes, 4,612,022, Cl. 55-60.000.

Progressive Tool & Industries Co.: *See—*
Zapawa, John J., 4,611,375, Cl. 29-157.30C.

Proizvodstvennoe Obiedinenie "Kievpromarmatura" : *See—*
Bugaenko, Vitaly F.; Linsky, Nikolai F.; Bychkova, Raisa I.; Karmugin, Boris V.; and Akopiants, Vladimir A., 4,611,625, Cl. 137-505.250.

Prottey, Colin: *See—*
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,612,331, Cl. 514-558.000.

Pryor, Michael J.: *See—*
Winter, Joseph; and Pryor, Michael J., 4,611,748, Cl. 228-170.000.

Pryor, Richard L.; and Cowhig, William M., to RCA Corporation. Hierarchical, computerized design of integrated circuits. 4,612,618, Cl. 364-490.000.

Puglia, Wayne J.; Rosa, Donna M.; DeTora, Sigismondo A.; and Beam, John E., to Nabisco Brands, Inc. Process for sweetening chewing gum with an L-aspartic acid sweetening derivative and products of improved sweetness stability obtained thereby. 4,612,195, Cl. 426-3.000.

Punako, Stephen; and Gallusser, David O., to Allied Corporation. Insert assembly for a connector. 4,611,873, Cl. 339-94.00M.

Purdue Research Foundation: *See—*
Wasserman, Gerald S., 4,611,596, Cl. 128-419.00R.

Purely Hanbai Co., Ltd.: *See—*
Shinkai, Takashi, 4,611,361, Cl. 15-104.930.

Quasar s.r.l.: *See—*
Cammarata, Italo, 4,611,818, Cl. 280-278.000.

Quenneville, Raymond N.; Mayne, Harry H.; and Sickler, Kenneth H., to Jacobs Manufacturing Company, The. Tool holder. 4,611,960, Cl. 409-234.000.

Quinones, Horatio: *See—*
Levine, Ernest N.; Lipschutz, Lewis D.; and Quinones, Horatio, 4,611,746, Cl. 228-123.000.

Qume Corporation: *See—*
Pedersen, Egon A., 4,611,802, Cl. 271-274.000.

Rabinovich, Joshua. Unrestricted swivel joint. 4,611,834, Cl. 285-131.000.

Rabo, Jule A.: *See—*
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,612,406, Cl. 585-329.000.

Radelow, Wolfgang: *See—*
Gerke, Dieter; Forberg, Horst; and Radelow, Wolfgang, 4,611,874, Cl. 339-97.00R.

Radtke, Charles S. Metal container end die. 4,611,481, Cl. 72-347.000.

Raffer, Gerhard: *See—*
Krenn, Manfred; Raffer, Gerhard; Wagendristel, Alfred; and Bangert, Herwig, 4,611,487, Cl. 73-81.000.

Ragusa, Vincent J. Apparatus for curing bonding material of artificial nail tips. 4,612,444, Cl. 250-492.100.

Rainger, Charles W.; Castillo, Allan P.; and Rogers, John C., to Sandusky Foundry & Machine Company. Pitting resistant duplex stainless steel alloy. 4,612,069, Cl. 148-325.000.

Ralph, James L., to Cole Sewell Corporation. Tape sealed surface layer for door construction. 4,611,452, Cl. 52-455.000.

Ramamurthy, Rajam S., to Board of Regents, University of Texas System. Simulator for teaching neonatal resuscitation. 4,611,998, Cl. 434-265.000.

Ramsey, Cecil L.; and Suarez, Francis S., to Inco Alloys International, Inc. Nickel copper alloys with enhanced malleability and improved sulfide distribution. 4,612,164, Cl. 420-455.000.

Rand McNally & Co.: *See—*
Breen, Thomas J., 4,611,826, Cl. 282-8.00R.

Rapp, Karl: *See—*
Kampichler, Gunter; and Rapp, Karl, 4,611,566, Cl. 123-506.000.

Ravichandran, Ramanathan; and Spivack, John D., to Ciba-Geigy Corporation. Bis(substituted thioalkyl)hydroxylamines and stabilized polyolefin compositions. 4,612,393, Cl. 564-300.000.

Ravinet, Ernest, to Tappan Company, The. Panel retaining arrangement. 4,611,841, Cl. 292-241.000.

Raytheon Company: *See—*
Beltran, Fernando, 4,612,548, Cl. 343-373.000.

RB Kunststoffpatent- Verwertungs AG: *See—*
Belz, Roland K., 4,612,355, Cl. 526-65.000.

RCA Corporation: *See—*
Barnes, Robert A., 4,612,574, Cl. 358-158.000.
den Hollander, Willem; and Hartmeier, Werner N., 4,612,568, Cl. 358-19.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,612,531, Cl. 340-347.0AD.
Erhardt, Harry G., 4,612,579, Cl. 358-213.000.
Hawrylo, Frank Z.; and Kowger, Henry V., deceased, 4,612,211, Cl. 427-86.000.
Hinn, Werner, 4,612,576, Cl. 358-171.000.
Keen, Ronald T., 4,612,577, Cl. 358-172.000.
Nossen, Edward J., 4,612,669, Cl. 455-123.000.
Packer, Marvin; and Fritz, John X., 4,612,249, Cl. 428-424.800.
Pampalone, Thomas R.; and Holder, Paula M., 4,612,270, Cl. 430-273.000.
Pollachek, Robert G., 4,612,459, Cl. 307-468.000.
Pritchard, Dalton H., 4,612,567, Cl. 358-11.000.
Pryor, Richard L.; and Cowhig, William M., 4,612,618, Cl. 364-490.000.
Stewart, Roger G., 4,612,466, Cl. 307-585.000.
Weimer, Paul K., 4,612,580, Cl. 358-213.000.

Redenbarger, Philip D.; and McCarty, Franklin R., to J. I. Case Company. Hood door assembly. 4,611,680, Cl. 180-69.240.

Redepenning, Jody G.: *See—*
Elliott, Cecil M.; and Redepenning, Jody G., 4,611,890, Cl. 350-357.000.

Redmond, Sanford. Dispenser package. 4,611,715, Cl. 206-484.000.

Reed Lignin, Inc.: *See—*
DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., 4,611,659, Cl. 166-274.000.

Reed Rock Bit Company: *See—*
Childers, John S.; Pastusek, Paul E.; and Schumacher, Percy W., Jr., 4,611,673, Cl. 175-340.000.

Refurbished Turbine Components Ltd.: *See—*
Fraser, Michael J.; and Legros, Raymond D., 4,611,744, Cl. 228-119.000.

Regebro, Bengt I. C.: *See—*
Pettersson, Rolf T.; Edlund, Hans G. U.; and Regebro, Bengt I. C., 4,611,540, Cl. 102-372.000.

Regula, Donald W.: *See—*
Liland, Alfred; and Regula, Donald W., 4,612,230, Cl. 428-167.000.

Reichard, George W., Jr.: *See—*
Clarke, John E.; Hardesty, Edwin C.; and Reichard, George W., Jr., 4,611,875, Cl. 339-154.00A.

Reichenecker, William J., to Westinghouse Electric Corp. Coupling aid for laser fusion of metal powders. 4,612,208, Cl. 427-53.100.

Reinhardt, Wilhelm: *See—*
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.

Reinker, Joseph F., Jr.: *See—*
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,611,618, Cl. 137-68.100.

Remington, Jack S.: *See—*
Desmonts, Georges; and Remington, Jack S., 4,612,281, Cl. 435-7.000.

Renga, James M., to Dow Chemical Company, The. Process for making esters. 4,612,386, Cl. 560-86.000.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru; and Sawada, Tetsuya, 4,612,006, Cl. 493-342.000.

Renken, Terry L., to Texaco, Inc. Use of supported phosphate catalysts for preparation of linear polyethylenepolyamines. 4,612,397, Cl. 564-479.000.

REPCO Limited: *See—*
Hadaway, Bernard M., 4,611,483, Cl. 72-453.020.

Republic Corporation: *See—*
Cassidy, Bruce A., 4,611,954, Cl. 405-261.000.

Research Association for Synthetic Fiber Technology: *See—*
Sasaki, Isao; Mori, Hiroshi; and Fujimoto, Masaharu, 4,612,363, Cl. 528-274.000.

Research Corporation: *See—*
Elliott, Cecil M.; and Redepenning, Jody G., 4,611,890, Cl. 350-357.000.

Rettig, Thomas A.: *See—*
Buser, Kenneth R.; and Rettig, Thomas A., 4,612,057, Cl. 134-13.000.

Rettke, Wilfried; and Tunys, Ladislav, to Triumph Adler AG. Mechanism for raising and feeding ink ribbons in typewriters and similar machines. 4,611,938, Cl. 400-212.000.

Reynolds, Martin L.; Frank, Dorothy M.; Riehl, Tilford F.; and McMurtrie, Andrew, to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,611,607, Cl. 131-336.000.

Rhone-Poulenc Industries: *See—*
Richard, Christian, 4,612,292, Cl. 501-27.000.

Rhone-Poulenc Sante: *See—*
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,612,401, Cl. 568-362.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Giroud-Abel, Bruno, 4,612,339, Cl. 524-84.000.
Seigneurin, Laurent, 4,612,184, Cl. 423-626.000.

Richard, Christian, to Rhone-Poulenc Industries. Lead/alkaline earth metal silicates and vitrescible compositions comprised thereof. 4,612,292, Cl. 501-27.000.

Richards, Walter L., to Methane Drainage Ventures. Multiple level methane drainage method. 4,611,855, Cl. 299-2.000.

Richardson, John: *See—*
Pinner, Vernon G.; and Richardson, John, 4,611,462, Cl. 57-263.000.

Richardson, William C.: *See—*
DeBons, Francis E.; Pedersen, Larry D.; Olsen, David K.; and Richardson, William C., 4,611,659, Cl. 166-274.000.

Richter, Donald L., to Temcor. Large span dome. 4,611,442, Cl. 52-81.000.

Ricketts, Thomas E.: *See—*
Cha, Chang Y.; and Ricketts, Thomas E., 4,611,856, Cl. 299-2.000.

Ricoh Company, Ltd.: *See—*
Ikesue, Masumi; and Ikeda, Takashi, 4,611,730, Cl. 222-167.000.
Takahashi, Harumi, 4,612,657, Cl. 377-32.000.
Yokota, Takashi, 4,611,864, Cl. 312-12.000.

Riedl, James: *See—*
Brimo, Rene J.; Lariviere, John; and Riedl, James, 4,612,102, Cl. 204-228.000.

Riehl, Tilford F.: *See—*
Reynolds, Martin L.; Frank, Dorothy M.; Riehl, Tilford F.; and McMurtrie, Andrew, 4,611,607, Cl. 131-336.000.

Rieker, Werner; and Schadlich, Fritz, to Robert Bosch GmbH. Electromagnetically operated driving tool with air damper. 4,611,742, Cl. 227-131.000.

Riker Laboratories, Inc.: *See—*
Wade, James J., 4,612,375, Cl. 544-311.000.

Riley, Brian: *See—*
Alexander, M. Grayson; and Riley, Brian, 4,612,263, Cl. 429-104.000.

Rimondi, Giovanni, to Societa' Pneumatici Pirelli Societa per Azioni. Agricultural and industrial tractor tires. 4,611,647, Cl. 152-209.00B.

Ringler, Shlomo; and Chavet, Itzhak. Device for reducing the danger of accidental detonation of a land mine. 4,611,411, Cl. 36-7.500.

Roane, James B. Endodontic instrument. 4,611,508, Cl. 76-24.00R.

Robert Bosch GmbH: *See—*
Bauer, Manfred, 4,611,563, Cl. 123-449.000.
Burkel, Rainer; Muller, Alfred; Peter, Cornelius; and Schwab, Manfred, 4,611,507, Cl. 74-866.000.
Franz, Peter; and Ross, Werner, 4,611,391, Cl. 29-597.000.
Kampichler, Gunter; and Rapp, Karl, 4,611,566, Cl. 123-506.000.
Rieker, Werner; and Schadlich, Fritz, 4,611,742, Cl. 227-131.000.

Robert, Serge; Cahart, Olivier F.; and Le Marchant, Pierre, to U.S. Philips Corporation. Authentication system between a card reader and a pay card exchanging data. 4,612,413, Cl. 178-22.080.

Roberts, Harold, to Magnetic Controls Company. Bi-directional optical fiber coupler. 4,611,884, Cl. 350-96.150.

Roberts, James R. Apparatus for indirect lighting of stairs. 4,612,606, Cl. 362-146.000.

Roberts, Noel A.: *See—*
Cashin, Colin H.; Roberts, Noel A.; and Tong, Brian P., 4,612,324, Cl. 514-400.000.

Robertson, Larry M. Picture hanging assembly. 4,611,780, Cl. 248-477.000.
Robieux, Jean; Cornillault, Jean; and Bettinger, Antoine, to Compagnie Generale d'Electricite. Optical system for determining an object's position. 4,611,917, Cl. 356-37.00S.
Robitschko, Peter: *See*—
Kurth, Hermann; and Robitschko, Peter, 4,612,530, Cl. 340-63.000.
Rockwell International Corporation: *See*—
Hickson, Russell L.; and Weber, James L., 4,611,694, Cl. 188-73.450.
Soclof, Sidney I., 4,611,387, Cl. 29-576.00W.
Rockwood, Clyde R.: *See*—
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,612,075, Cl. 156-242.000.
Roco Tool Group, Inc.: *See*—
Haas, John L., 4,611,823, Cl. 280-641.000.
Rode, John E., to Temper-Ring Equipment Corporation. Adjustable shaft support arrangement. 4,611,935, Cl. 384-548.000.
Roehle, Helmut: *See*—
Fabian, Werner; Roehle, Helmut; and Wolfram, Peter, 4,612,174, Cl. 423-210.000.
Rogers, John C.: *See*—
Rainger, Charles W.; Castillo, Allan P.; and Rogers, John C., 4,612,069, Cl. 148-325.000.
Rogers, Percy E.: *See*—
McCaffrey, David J. A.; Rogers, Percy E.; and Carlton, James, 4,612,405, Cl. 568-916.000.
Rohm GmbH: *See*—
Besecke, Siegmund; Liebler, Ralf; Hohage, Heinz-Juergen; and Schroeder, Guenter, 4,612,358, Cl. 526-259.000.
Rohm and Haas Company: *See*—
Bigwood, Michael P.; and Naples, John O., 4,612,288, Cl. 435-180.000.
Rokutan, Takao, to Olympus Optical Co., Ltd. Modified Miller data demodulator. 4,612,508, Cl. 329-50.000.
Romano, Frank S. Sliding cover assembly for open body trucks. 4,611,848, Cl. 296-98.000.
Rosa, Donna M.: *See*—
Puglia, Wayne J.; Rosa, Donna M.; DeTora, Sigismondo A.; and Beam, John E., 4,612,195, Cl. 426-3.000.
Rose, Andrew M.: *See*—
Sordello, Frank J.; and Rose, Andrew M., 4,612,586, Cl. 360-31.000.
Rose, William H.; and Shaffer, David T., to AMP Incorporated. Single in-line package switch. 4,612,422, Cl. 200-5.00R.
Rosemount Inc.: *See*—
Koosmann, Mark R., 4,611,492, Cl. 73-579.000.
Rosen, Harold A., to Hughes Aircraft Company. Satellite command link protection system. 4,612,546, Cl. 343-352.000.
Rosen, Perry: *See*—
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,612,380, Cl. 549-415.000.
Rosenberger, Siegfried, to Ciba-Geigy Corporation. Stabilized rubber or lubricant compositions containing mercaptoalkyl esters of hindered phenols. 4,612,131, Cl. 252-48.600.
Rosenwald, Diane: *See*—
Wallin, Glenn; Rosenwald, Diane; Citti, James; and Yong, Samuel, 4,612,198, Cl. 426-94.000.
Rosier, Brian K., to Harris Corporation. EEPROM margin testing design. 4,612,630, Cl. 365-201.000.
Ross, Werner: *See*—
Franz, Peter; and Ross, Werner, 4,611,391, Cl. 29-597.000.
Rothwell, Harold L., Jr.: *See*—
English, George J.; and Rothwell, Harold L., Jr., 4,612,000, Cl. 445-6.000.
Rowe, Eugene T. Method and apparatus for converting human exercise energy to stored kinetic energy. 4,612,447, Cl. 290-1.00R.
Rowton, Danny E., to Arnall, Henry O.; and Skelton, Royce J. Sheetrock hammer attachment. 4,611,739, Cl. 227-66.000.
Rudd, Gordon: *See*—
Skinnell, John A., 4,611,726, Cl. 220-408.000.
Ruhrgas Aktiengesellschaft: *See*—
Kuhn, Friedhelm, 4,612,065, Cl. 148-16.000.
Rundle, Kenneth P. Garden tractor transaxle with planetary differential input. 4,611,504, Cl. 74-695.000.
Rung, Robert; and Ache, Lani G., to Victaulic Company of America. Self-adjusting pipe clamp and coupling. 4,611,839, Cl. 285-367.000.
Rupp, Herbert E. Outrigger clips. 4,611,423, Cl. 43-43.120.
Russell, Charles G., to Du Pont Canada Inc. Preparation of triethyl dimethyl siloxalane. 4,612,382, Cl. 556-173.000.
Russomano, Richard J., to Foster Wheeler Energy Corporation. Method and apparatus for removing contaminants from soil. 4,611,950, Cl. 405-128.000.
Rutledge, Raleigh N.: *See*—
Hahn, Granville J.; Rutledge, Raleigh N.; Johnson, Marion; Murley, Jackie D.; and Blanchard, Carl, 4,611,987, Cl. 425-131.100.
Rydstad, Hans: *See*—
Nazmy, Mohamed Y.; Rydstad, Hans; Schroder, Gunther; and Singer, Robert, 4,612,062, Cl. 148-11.50N.
Ryschka, Martin; Falb, Wolfgang; Buttner, Peter; and Wallroth, Carl-Friedrich, to Dragerwerk Aktiengesellschaft. Arrangement for adding liquid anesthetic to the respiratory gas supplied to a patient. 4,611,590, Cl. 128-203.140.
S.I.C.A.R.T. (Societe Indusrielle de Construction d'Accessories Radio et Television: *See*—
Dreyer, Claude, 4,612,551, Cl. 343-765.000.
S R I International: *See*—
Laine, Richard M.; and Blum, Yigal, 4,612,383, Cl. 556-412.000.
Sado, Ichiro, to Canon Kabushiki Kaisha. Electronic language learning machine. 4,611,995, Cl. 434-157.000.
Saether, Gustav, to Lyng Industrier A-S. Mixing device for mixing two fluids, especially hot and cold water. 4,611,757, Cl. 236-12.120.
Sagane, Toshihiro; and Nagano, Riichiro, to Mitsui Petrochemical Industries, Ltd. Laminated structure having post-chlorinated adhesive olefin resin layer. 4,612,252, Cl. 428-516.000.
Sagara, Hiroji, to Hoya Corporation. Glass for eye glass lens. 4,612,295, Cl. 501-51.000.
Saiga, Yutaka: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,612,317, Cl. 514-292.000.
Saint-M'Leuz, Rene-Pierre, to Institut Francais du Petrole; Bouygues Offshore; Compagnie Francaise d'Entreprises Metalliques CFEM; Alsthom Atlantique; and Compagnie General pour les Developpements Operationnels des Richesses Sous-Marines CG Doris. Method of fabricating the lines of a taut-line platform and of prepositioning them prior to final fixing. 4,611,952, Cl. 405-224.000.
Saito, Junichi; and Tamura, Tatsuo, to Nihon Tokushu Noyaku Seizo K.K. Process for the preparation of phenyl N-(2-biphenylylsulfonyl) carbamate. 4,612,385, Cl. 560-12.000.
Saito, Mitsuru: *See*—
Ohzono, Kohei; Saito, Mitsuru; and Hayashi, Kiyotaka, 4,612,003, Cl. 474-28.000.
Saito, Takao: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,612,336, Cl. 522-3.000.
Saito, Tsuneo: *See*—
Kojima, Ryuiji; Suzuki, Naomi; Sato, Yokichi; and Saito, Tsuneo, 4,612,060, Cl. 148-6.15Z.
Sakamoto, Akira: *See*—
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, 4,612,627, Cl. 364-736.000.
Sakamoto, Daizi: *See*—
Watanabe, Rikizo; and Sakamoto, Daizi, 4,612,167, Cl. 420-471.000.
Sakamoto, Hiroshi; and Miyoshi, Tadahiko, to Hitachi, Ltd. High toughness silicon nitride sintered body and process for producing the same. 4,612,296, Cl. 501-93.000.
Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Body-weight adjusting device of a seat suspension. 4,611,783, Cl. 248-588.000.
Sakane, Ikuo, to Pioneer Electronic Corporation. Head base drive mechanism of cassette tape player. 4,612,589, Cl. 360-90.000.
Sakayori, Yuji: *See*—
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.
Sakuragi, Isao: *See*—
Genba, Tsuneo; Mizobe, Akio; Okazaki, Masaki; and Sakuragi, Isao, 4,612,157, Cl. 264-185.000.
Sakurai, Yoshihiko: *See*—
Miyanaga, Choshichi; Sakurai, Yoshihiko; Iida, Katsumi; and Hagiwara, Akihiro, 4,611,755, Cl. 236-13.000.
Salerni, John V.; and Wetzel, Rodney J., to Baker Oil Tools, Inc. High pressure retrievable gravel packing apparatus. 4,611,658, Cl. 166-134.000.
Salvi, Michele, to Schering AG. Method for coating slabs of natural or artificial stone. 4,612,214, Cl. 427-136.000.
Sampey, Ronald W., to Tri-Mark Metal Corporation. Paint spray booth cleaning apparatus. 4,612,025, Cl. 55-223.000.
Samuelsson, Soren. Squeegee holding apparatus. 4,611,363, Cl. 15-245.000.
Sanchez, Domingo: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,611,370, Cl. 26-3.000.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Singeing apparatus for cloth. 4,611,370, Cl. 26-3.000.
Sandusky Foundry & Machine Company: *See*—
Rainger, Charles W.; Castillo, Allan P.; and Rogers, John C., 4,612,069, Cl. 148-325.000.
Sangiorgi, Cesare. Production line for bitumen cakes. 4,611,978, Cl. 425-73.000.
Sanitary Products Corp.: *See*—
Wenzel, George, 4,612,135, Cl. 252-106.000.
Sanitary Scale Company: *See*—
Karp, Edward C., 4,612,078, Cl. 156-493.000.
Sanjurjo, Angel; and Pressacco, Sylvia, to SRI International. Process for purification of solid silicon 4,612,179, Cl. 423-348.000.
Sankyo Dengyo Co. Ltd.: *See*—
Tomiyasu, Hiroshi; Hattori, Masahiro; and Itoh, Yoshio, 4,611,763, Cl. 241-30.000.
Sano, Fumiaki: *See*—
Wada, Fumio; Ishijima, Koji; Sano, Fumiaki; and Asami, Kazutomo, 4,611,473, Cl. 62-503.000.
Sano, Hiroyuki: *See*—
Iijima, Takeo; and Sano, Hiroyuki, 4,612,187, Cl. 424-16.000.

Sanraku Incorporated: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Sumigawa, Yukio, 4,611,559, Cl. 123-196.00A.

Sanyo Electric Co., Ltd.: *See*—
Iwaki, Hiroshi, 4,611,906, Cl. 355-14.00R.

Sapp, Bobby L., to American Cyanamid Company. Process for reclamation of excavated mine sites. 4,611,951, Cl. 405-128.000.

Sarac, Vinko. FM wireless transmitter. 4,612,668, Cl. 455-120.000.

Saruwatari, Yoshihiko: *See*—
Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, 4,611,867, Cl. 339-14.00R.

Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Vehicle height control system. 4,611,815, Cl. 280-6.00R.

Sasaki, Isamu: *See*—
Kayakabe, Nobuhiro; and Sasaki, Isamu, 4,611,702, Cl. 192-110.00R.

Sasaki, Isao; Mori, Hiroshi; and Fujimoto, Masaharu, to Mitsubishi Rayon Co., Ltd.; and Research Association for Synthetic Fiber Technology. Process for the production of polyester. 4,612,363, Cl. 528-274.000.

Sasaki, Nobukazu: *See*—
Kasamura, Toshirou; and Sasaki, Nobukazu, 4,611,899, Cl. 355-3.0DD.

Sasaya, Osamu: *See*—
Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, 4,612,268, Cl. 430-28.000.

Sato, Hideo: *See*—
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,612,271, Cl. 430-72.000.

Sato, Jin: *See*—
Homma, Naoshi; and Sato, Jin, 4,612,303, Cl. 514-23.000.

Sato, Masami, to Stephano & Co., Ltd.; and Sato, Masami. Method for producing refreshable dry food. 4,612,200, Cl. 426-242.000.

Sato, Masayoshi: *See*—
Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, 4,612,561, Cl. 357-38.000.

Sato, Masayuki: *See*—
Kaneko, Chikara; Sato, Masayuki; and Ogasawara, Hiromichi, 4,612,379, Cl. 549-274.000.

Sato, Toshiya; Asano, Kenichi; and Yamaguchi, Yuzo, to Takasago Perfumery Co., Ltd. Growth inhibitor for cariogenic bacteria. 4,612,190, Cl. 424-49.000.

Sato, Yasushi: *See*—
Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, 4,611,568, Cl. 123-559.000.

Sato, Yokichi: *See*—
Kojima, Ryuiji; Suzuki, Naomi; Sato, Yokichi; and Saito, Tsuneo, 4,612,060, Cl. 148-6.15Z.

Sato, Yoshiaki; and Takahashi, Osamu, to Silver Seiko Ltd. Ribbon feed mechanism for a printer. 4,611,937, Cl. 400-208.000.

Sato, Yuichi: *See*—
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,612,454, Cl. 307-311.000.

Satoh, Shin: *See*—
Katsuyama, Toshio; Satoh, Shin; and Matsumura, Hiroyoshi, 4,612,294, Cl. 501-40.000.

Satzinger, Gerhard: *See*—
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.

Sauer, Earl S.: *See*—
Kiersarsky, Albert; Sauer, Earl S.; Vesperman, William; and Wilson, Max K., 4,612,233, Cl. 428-206.000.

Sawa, Tsutomu: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.

Sawada, Tetsuya: *See*—
Tokuno, Masateru; and Sawada, Tetsuya, 4,612,006, Cl. 493-342.000.

Schack, Peter: *See*—
Edeling, Martin; Freller, Helmut; Mund, Konrad; and Schack, Peter, 4,612,100, Cl. 204-192.150.

Schadlich, Fritz: *See*—
Rieker, Werner; and Schadlich, Fritz, 4,611,742, Cl. 227-131.000.

Schafer, Paul; Abel, Heinz; Guth, Christian; and Stehlin, Albert, to Ciba-Geigy Corporation. Water-soluble or water-dispersible graft polymers, their preparation and their use. 4,612,352, Cl. 525-404.000.

Schafer, Paul: *See*—
Jaeger, Carl A.; Berendt, Hans-Ulrich; and Schafer, Paul, 4,612,016, Cl. 8-543.000.

Schaffer, Ronald R.: *See*—
Glover, Douglas W.; Hoffer, John C.; Johnson, Erlon F.; and Schaffer, Ronald R., 4,611,887, Cl. 350-96.210.

Schake, Fritz: *See*—
Wassmer, Paul; and Schake, Fritz, 4,611,646, Cl. 144-117.00R.

Scheidweiler, Andreas: *See*—
Buehler, Richard; Muggli, Jurg; Scheidweiler, Andreas; and Schibli, Eugen, 4,612,534, Cl. 340-505.000.

Scheithauer, Richard A.; Vanderpool, Clarence D.; and Miller, Michael J., to GTE Products Corporation. Production of pure cobalt metal powder. 4,612,039, Cl. 75-0.5AA.

Schepis, Nunziato. Hair curling units and their production. 4,611,610, Cl. 132-39.000.

Schering AG: *See*—
Salvi, Michele, 4,612,214, Cl. 427-136.000.

Schering Aktiengesellschaft: *See*—
Mahlkow, Hartmut; and Blasing, Horst, 4,611,554, Cl. 118-316.000.

Scheuffgen, Ingeborg; and Meffert, Alfred, to Henkel Kommanditgesellschaft auf Aktien. Oil components for cosmetics and pharmaceuticals. 4,612,192, Cl. 424-70.000.

Schibbye, (Lars) Laurtiz B.; and Englund, Rolf A., to Sullair Technology AB. Capacity and internal compression control device in a screw compressor. 4,611,976, Cl. 418-159.000.

Schibli, Eugen: *See*—
Buehler, Richard; Muggli, Jurg; Scheidweiler, Andreas; and Schibli, Eugen, 4,612,534, Cl. 340-505.000.

Schirmer, Henry G.: *See*—
Gillio-tos, Mario; Vassarotti, Enzo; Schirmer, Henry G.; and von Bismarck, Gottfried, 4,611,456, Cl. 53-427.000.

Schlegel, Charles T.: *See*—
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.

Schlein, Seymour N. Anchor nail fastener. 4,611,964, Cl. 411-356.000.

Schlinsog, Hans-Jurgen; and Kowalzik, Siegfried, to Herberts Gesellschaft mit beschrankter Haftung. Device for holding hollow bodies. 4,612,107, Cl. 204-300.0EC.

Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, to United States of America, Health and Human Services. Monoclonal antibodies reactive with human breast cancer. 4,612,282, Cl. 435-68.000.

Schlyter, Yngve S. G., to Bildsystem AB. Projector for producing a light spot of polarized light for biostimulation purposes. 4,612,604, Cl. 362-19.000.

Schmale, Carl, to Carl Schmale GmbH & Co. KG. Process and apparatus for continuous lengthwise cutting of a pile web. 4,611,517, Cl. 83-56.000.

Schmanski, Donald W., to Carsonite International Corporation, a Division of AMETEK. Detachable base for road delineators. 4,611,949, Cl. 404-9.000.

Schmetz GmbH: *See*—
Schmetz, Peter, 4,612,064, Cl. 148-13.000.

Schmetz, Peter, to Schmetz GmbH. Method for heat-treating a charge using a vacuum furnace. 4,612,064, Cl. 148-13.000.

Schmidt, Erick; Grenier, Leonard E.; and Pallagi, Steven, to General Systems Research, Ltd. Optical apparatus for scanning radiation over a surface. 4,611,881, Cl. 350-6.900.

Schmidt, Frederick A.; Peterson, David T.; and Wheelock, John T., to United States of America, Energy. Preparations of rare earth-iron alloys by thermite reduction. 4,612,047, Cl. 420-83.000.

Schmidt, Paul H.: *See*—
Forrest, Stephen R.; Kaplan, Martin L.; and Schmidt, Paul H., 4,611,385, Cl. 29-574.000.

Schmidt, Rudolf, to Caroline Christ, Fabrikation chemischer Erzeugnisse. Apparatus for cleaning parts of processing machines from residues. 4,611,614, Cl. 134-107.000.

Schmitt, Dale A.: *See*—
Wilson, Michael D.; and Schmitt, Dale A., 4,611,449, Cl. 52-278.000.

Schmolke, Karl-Heinz, to Hollingsworth GmbH. Method for treating the edges of a sawtooth wire for the card clothing of textile machines. 4,612,084, Cl. 156-639.000.

Schneider, Eckhard: *See*—
Heitmann, Knut; Hoppe, Martin; Schneider, Eckhard; and Thaer, Andreas, 4,612,267, Cl. 430-3.000.

Schneider, Martin V.: *See*—
Gans, Michael J.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,612,518, Cl. 332-21.000.

Schnelle, Steven H.; Wood, Richard D.; and Weicht, Charles E., to United Technologies Automotive, Inc. Method for manufacturing a check valve contained within a tube. 4,611,374, Cl. 29-157.10R.

Schoch, Robert, to Weinmann GmbH & Co., KG. Bicycle wheel rim brake. 4,611,690, Cl. 188-24.110.

Schoenberg, Julian H.: *See*—
Mueller, Walter B.; and Schoenberg, Julian H., 4,612,245, Cl. 428-340.000.

Schon, Klaus-Peter, to Hoechst Aktiengesellschaft. Roller for pressing a sheet against a heating surface. 4,611,902, Cl. 355-3.0FU.

Schopke, Claus-Peter: *See*—
Buchholz, Peter; Schopke, Claus-Peter; and Warnecke, Rolf, 4,611,633, Cl. 138-26.000.

Schrag, Gerhard: *See*—
Stoll, Kurt; Heid, Georg; Schrag, Gerhard; and Wagner, Albrecht, 4,611,530, Cl. 92-13.500.

Schrier, Melvin, to Eyedex Associates. Eye chart for screening computer monitor operators. 4,611,893, Cl. 351-239.000.

Schroder, Gunther: *See*—
Nazmy, Mohamed Y.; Rydstad, Hans; Schroder, Gunther; and Singer, Robert, 4,612,062, Cl. 148-11.50N.

Schroder, Willi: *See*—
Bosshard, Werner; and Schroder, Willi, 4,611,525, Cl. 89-193.000.

Schroeder, Guenter: *See—*
Besecke, Siegmund; Liebler, Ralf; Hohage, Heinz-Juergen; and Schroeder, Guenter, 4,612,358, Cl. 526-259.000.

Schumacher, Percy W., Jr.: *See—*
Childers, John S.; Pastusek, Paul E.; and Schumacher, Percy W., Jr., 4,611,673, Cl. 175-340.000.

Schumann, Reinhold: *See—*
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.

Schurich, Bernd: *See—*
Hewig, Gert; Huschka, Hans; Schurich, Bernd; and Worner, Jorg, 4,612,410, Cl. 136-256.000.

Schurter, Rolf: *See—*
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,612,037, Cl. 71-92.000.

Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., to Eaton Corporation. Lateral bidirectional notch FET with gates at non-common potentials. 4,612,465, Cl. 307-584.000.

Schwab, Manfred: *See—*
Burkel, Rainer; Muller, Alfred; Peter, Cornelius; and Schwab, Manfred, 4,611,507, Cl. 74-866.000.

Schwartz, Mark E., to Minnesota Mining and Manufacturing Company. Flexographic ink composition. 4,612,052, Cl. 106-31.000.

Schwartzkopf, George: *See—*
Kruger, Paul J.; and Schwartzkopf, George, 4,612,034, Cl. 71-80.000.

Schweitzer, John J.: *See—*
Stricker, Peter A.; and Schweitzer, John J., 4,611,529, Cl. 91-499.000.

Schwindeman, James A.: *See—*
Van Gemert, Barry; Lavanish, Jerome M.; and Schwindeman, James A., 4,612,038, Cl. 71-92.000.

Scott, Lowell C.: *See—*
Emerson, William D.; Hill, Deborah J.; Loeb, Karen C.; Mizrahi, Albert; Schlegel, Charles T.; and Scott, Lowell C., 4,612,416, Cl. 179-6.110.

Sea-Land Corporation: *See—*
Van Iperen, Willem H. P.; and Cowhey, Thomas M., 4,611,961, Cl. 410-20.000.

Seely, Neil G., to Eastman Kodak Company. Metering roll film holders and multi-format camera. 4,611,895, Cl. 354-159.000.

Seeq Technology, Inc.: *See—*
Mehrotra, Sanjay; and Perlegos, Gust, 4,612,640, Cl. 371-51.000.

Seese, Philip A.: *See—*
Cho, Frederick Y.; Joseph, John R.; and Seese, Philip A., 4,612,274, Cl. 430-296.000.

Seevinck, Evert, to U.S. Philips Corporation. Differential amplifier. 4,612,513, Cl. 330-261.000.

Segoshi, Toru; and Mutoh, Masakazu, to Nissan Motor Co., Ltd. Automotive lamp unit. 4,612,607, Cl. 362-267.000.

Seifert, Dennis D., to Esco Corporation. Retainer apparatus for releasably securing a bowl liner in a rock crusher. 4,611,766, Cl. 241-207.000.

Seiferth, Oscar E.: *See—*
Brown, Richard K.; and Seiferth, Oscar E., 4,612,431, Cl. 219-10.55E.

Seiffert, Gunther, to F.W. Oventrop Arn. Aohn KG. Thermostatically actuated valve. 4,611,629, Cl. 137-614.210.

Seigneurin, Laurent, to Rhone-Poulenc Specialites Chimiques. High specific surface hydrargillite. 4,612,184, Cl. 423-626.000.

Seiko Epson Corporation: *See—*
Kawashima, Hiroshi; Mogami, Takao; and Kubota, Satoshi, 4,611,892, Cl. 351-159.000.

Sekhar, Rajagopalan C. Re-windable fire escape. 4,611,688, Cl. 182-237.000.

Sekine, Yoshitada: *See—*
Abe, Kazuyoshi; Kawasaki, Masahiko; Yazaki, Kazuhiko; and Sekine, Yoshitada, 4,611,380, Cl. 29-430.000.

Selman, John J.: *See—*
Figler, Alan A.; and Selman, John J., 4,612,639, Cl. 371-25.000.

Senet, Jean-Pierre: *See—*
Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., 4,612,143, Cl. 558-282.000.

Senstar Security Systems, Corporation: *See—*
Harman, R. Keith, 4,612,536, Cl. 340-552.000.

Sentner, David A.: *See—*
Guzowski, Matthew M.; Sentner, David A.; and Sigworth, Geoffrey K., 4,612,073, Cl. 148-415.000.

Sequin, Kenneth; and Burke, Edward F. Add-on alert system. 4,612,535, Cl. 340-539.000.

Sera Solar Corporation: *See—*
Moddel, Garret R.; Christel, Lee A.; and Gibbons, James F., 4,612,408, Cl. 136-244.000.

Seshimoto, Osamu: *See—*
Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,612,290, Cl. 436-97.000.

SGS-ATES Componenti Elettronici SpA: *See—*
Stefani, Fabrizio; Cini, Carlo; and Alzati, Angelo, 4,612,452, Cl. 307-300.000.

Shaffer, David T.: *See—*
Rose, William H.; and Shaffer, David T., 4,612,422, Cl. 200-5.00R.

Shaner, Jay R.: *See—*
Joo , Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,611,396, Cl. 29-623.500.

Shannon, Suel G.: *See—*
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,611,878, Cl. 339-186.00M.

Shapiro, Eugene: *See—*
Brock, Andrew J.; Smith, Edward F.; and Shapiro, Eugene, 4,612,166, Cl. 420-470.000.

Sharp-Geisler, Bradley A., to Monolithic Memories, Inc. Etching plasma generator diffusor and cap. 4,612,432, Cl. 219-121.0PG.

Sharp Kabushiki Kaisha: *See—*
Inui, Koichi; and Makita, Hiroshi, 4,611,591, Cl. 128-205.240.

Sharron, Nathan N.: *See—*
Smith, Berry E., Jr.; and Sharron, Nathan N., 4,612,470, Cl. 310-273.000.

Shaw Industries Ltd.: *See—*
Jarvis, Harold F., 4,611,635, Cl. 138-146.000.

Shell Oil Company: *See—*
Spaargaren, Klaas; and Leyen, Adrianus C. W., 4,611,489, Cl. 73-304.00C.

Sheller-Globe Corporation: *See—*
Davis, Alfred L., 4,612,224, Cl. 428-109.000.

Shen, Sidney Y.: *See—*
Landry, James F.; Croudace, Michael C.; On, Harry P., Jr.; and Shen, Sidney Y., 4,612,130, Cl. 252-39.000.

Sherer, Jimmie B.: *See—*
Westphal, Glenn H.; and Sherer, Jimmie B., 4,612,082, Cl. 156-607.000.

Sherman, Michael I.; and Elmore, Carl L., to Kamyr, Inc. Acid hydrolysis of biomass for alcohol production. 4,612,286, Cl. 435-157.000.

Sherwood, Philip W.: *See—*
Dai, Shenghong A.; and Sherwood, Philip W., 4,612,098, Cl. 204-181.700.

Shibata, Yoshiaki: *See—*
Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, 4,611,568, Cl. 123-559.000.

Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, to Diesel Kiki Co., Ltd. Vane compressor with vane back pressure adjustment. 4,611,977, Cl. 418-76.000.

Shields, Marsha W.: *See—*
Kupper, Philip L.; and Shields, Marsha W., 4,612,205, Cl. 426-599.000.

Shigaki, Masafumi; and Takeda, Yukio, to Fujitsu Limited. Feedback amplifier. 4,612,514, Cl. 330-277.000.

Shih, Stuart S.: *See—*
Angevine, Philip J.; Mitchell, Kenneth M.; Oleck, Stephen M.; and Shih, Stuart S., 4,612,108, Cl. 208-111.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,611,500, Cl. 74-489.000.
Nagano, Masashi, 4,612,004, Cl. 474-80.000.

Shimauchi, Yasutaka: *See—*
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.

Shimazaki, Yoshikazu; Shimizu, Suekichi; and Nakajima, Nobuyuki, to Fuji Kagakushi Kogyo Co., Ltd. Reusable heat-sensitive transfer element. 4,612,243, Cl. 428-321.300.

Shimizu, Akira: *See—*
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, 4,612,627, Cl. 364-736.000.

Shimizu, Makoto: *See—*
Abe, Ryusuke; Shimizu, Makoto; and Hirose, Yasuo, 4,612,159, Cl. 376-351.000.

Shimizu, Shinji; and Miyazawa, Hiroyuki, to Hitachi, Ltd. Semiconductor memory device. 4,612,565, Cl. 357-71.000.

Shimizu, Suekichi: *See—*
Shimazaki, Yoshikazu; Shimizu, Suekichi; and Nakajima, Nobuyuki, 4,612,243, Cl. 428-321.300.

Shimizu, Toshihide; Furukawa, Yasuo; and Kaneko, Ichiro, to Shin-Etsu Chemical Co., Ltd. Method for preventing polymer scale deposition in the polymerization of a vinylic monomer. 4,612,354, Cl. 526-62.000.

Shimizu, Toshio: *See—*
Tsukui, Tsutomu; Shimizu, Toshio; and Doi, Ryouta, 4,612,261, Cl. 429-13.000.

Shimizu, Wataru; and Yamashita, Akira, to Kabushiki Kaisha S G. Rotation speed detection device having a rotation angle detector of inductive type. 4,612,503, Cl. 324-208.000.

Shimojima, Katsuhiko; Hamaguchi, Masaki; Obana, Hiroshi; Aizawa, Takemi; and Ninomiya, Hiroyuki, to Onoda Cement Co., Ltd.; and Kabushiki Kaisha Kobe Seikosho. Roller mill. 4,611,765, Cl. 241-121.000.

Shimomura, Raiji, to Hitachi, Ltd. System and method for controlling an industrial robot. 4,612,487, Cl. 318-568.000.

Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, to Nisshin Steel Company, Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Method of controlling deposition amount distribution in a vacuum deposition plating. 4,612,206, Cl. 427-9.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Shimizu, Toshihide; Furukawa, Yasuo; and Kaneko, Ichiro, 4,612,354, Cl. 526-62.000.

Shinkai, Takashi, to Purely Hanbai Co., Ltd.; and Awa Paper Manufacturing Co., Ltd. Sheet materials for cleaning conveying rolls and guides of a facsimile apparatus. 4,611,361, Cl. 15-104.930.

Shintaku, Yasuyuki, to Chugai Ro Co., Ltd. Method for making aluminum nitride powder. 4,612,045, Cl. 75-68.00R.

Shintani, Takashi: *See—*
Okuzono, Shuichi; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,612,343, Cl. 524-547.000.

Shionogi & Co., Ltd.: *See—*
Ogata, Masaru; Matsumoto, Hiroshi; Kida, Shiro; and Tawara, Katsuya, 4,612,322, Cl. 514-383.000.

Shirokane, Makoto: *See—*
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
Kosugi, Seiji; and Takata, Hideyuki, 4,611,631, Cl. 137-625.650.

Shor International Corporation: *See—*
Shor, Peter S., 4,612,093, Cl. 204-111.000.

Shor, Peter S., to Shor International Corporation. Method and apparatus for purification of gold. 4,612,093, Cl. 204-111.000.

Showa Aluminum Corporation: *See—*
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,611,790, Cl. 266-235.000.

Shum, Wilfred P.; and White, John F., to Atlantic Richfield Company. Method for producing branched carbonylation products from alpha unsaturated olefins. 4,612,390, Cl. 562-522.000.

Shuto, Ituo: *See—*
Yamaura, Mitsuru; and Shuto, Ituo, 4,612,594, Cl. 361-68.000.

Siano, Donald B.: *See—*
Bock, Jan; Downs, Hartley H.; Siano, Donald B.; and Pace, Salvatore J., 4,612,332, Cl. 521-65.000.

Sickler, Kenneth H.: *See—*
Quenneville, Raymond N.; Mayne, Harry H.; and Sickler, Kenneth H., 4,611,960, Cl. 409-234.000.

Siden, Jan, to Finsliparna AB. Abrasive wheel for pin bore crowns. 4,611,438, Cl. 51-206.00R.

Siegenia-Frank, KG: *See—*
Kucharczyk, Eckhard, 4,611,531, Cl. 98-39.100.

Siemens Aktiengesellschaft: *See—*
Botvidsson, Lars; and Mund, Konrad, 4,611,604, Cl. 128-784.000.
Burger, Rudolf; Kobras, Franz; Kohler, Gerd; Niedermayr, Erich; and Poessinger, Josef, 4,611,843, Cl. 294-86.400.
Edeling, Martin; Freller, Helmut; Mund, Konrad; and Schack, Peter, 4,612,100, Cl. 204-192.150.
Grallert, Hans-Joachim; and Starck, Alexander, 4,612,573, Cl. 358-140.000.
Patalong, Hubert, 4,612,449, Cl. 307-252.00C.
Strack, Helmut, 4,612,448, Cl. 307-252.00G.

Siemens-Allis, Inc.: *See—*
Laplace, Carl J., Jr.; and Williams, Conrad F., 4,612,617, Cl. 364-483.000.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Fluck, Rene , 4,611,705, Cl. 198-425.000.

Sigalla, Armand: *See—*
Goldhammer, Mark I.; and Sigalla, Armand, 4,611,773, Cl. 244-35.00R.

Signetics Corporation: *See—*
Broadbent, Eliot K., 4,612,257, Cl. 428-620.000.

Signode Corporation: *See—*
Graffam, Don E.; Lezon, Lawrence L.; and Slaters, Arthur R., Jr., 4,612,225, Cl. 428-116.000.

Sigworth, Geoffrey K.: *See—*
Guzowski, Matthew M.; Sentner, David A.; and Sigworth, Geoffrey K., 4,612,073, Cl. 148-415.000.

Sikka, Vinod K., to United States of America, Energy. Method for welding chromium molybdenum steels. 4,612,070, Cl. 148-127.000.

Siltec Marketing International Ltd.: *See—*
Brimo, Rene J.; Lariviere, John; and Riedl, James, 4,612,102, Cl. 204-228.000.

Silver Seiko Ltd.: *See—*
Sato, Yoshiaki; and Takahashi, Osamu, 4,611,937, Cl. 400-208.000.

Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking unit for a printing machine. 4,611,538, Cl. 101-365.000.

Simmat, Fritz: *See—*
Kreutzer, Karl; and Simmat, Fritz, 4,612,023, Cl. 65-32.000.

Simplex Ceiling Corp.: *See—*
Nassof, Martin, 4,611,444, Cl. 52-145.000.

Sinclair, Harold C., to Milliken Research Corporation. Buffing wheel. 4,611,362, Cl. 15-230.150.

Sinclair Research Limited: *See—*
Westwood, James S.; and Maydew, Peter H., 4,612,484, Cl. 315-384.000.

Singer, Robert: *See—*
Nazmy, Mohamed Y.; Rydstad, Hans; Schroder, Gunther; and Singer, Robert, 4,612,062, Cl. 148-11.50N.

Skelton, Royce J.: *See—*
Rowton, Danny E., 4,611,739, Cl. 227-66.000.

SKF GmbH: *See—*
Brandenstein, Manfred; Edelmann, Ludwig; and Kaschube, Karl-Friedrich, 4,611,931, Cl. 384-477.000.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,611,932, Cl. 384-481.000.

Skinnell, John A., to Rudd, Gordon; and Vaughan, James C. Utility container configured for use with an open-topped vessel. 4,611,726, Cl. 220-408.000.

Slaters, Arthur R., Jr.: *See—*
Graffam, Don E.; Lezon, Lawrence L.; and Slaters, Arthur R., Jr., 4,612,225, Cl. 428-116.000.

Sloan, Dallas; Venzke, Donald R.; and Wehr, Eugene, to Square D Company. Anti-rebound latch. 4,612,430, Cl. 200-327.000.

Sluyterman, Albertus A. S.; and Vink, Nicolaas G., to U.S. Philips Corporation. Method of manufacturing a saddle-shaped deflection coil for a picture display tube and deflection system having saddle-shaped deflection coils. 4,612,525, Cl. 335-213.000.

Smalley, Daniel S. Induction furnace fault locator. 4,612,498, Cl. 324-52.000.

Smids, Ronald E. Method and apparatus for making variegated, cathedral, antique or flashed glass in a continuous sheet. 4,612,030, Cl. 65-91.000.

Smith, Alan; and Yates, Stephen W., to Hollingsworth (U.K.) Ltd. Open-end spinning machine. 4,611,463, Cl. 57-263.000.

Smith, Berry E., Jr.; and Sharron, Nathan N. Electric generator with two rotors. 4,612,470, Cl. 310-273.000.

Smith, Donald L.: *See—*
Tracy, David H.; and Smith, Donald L., 4,612,077, Cl. 156-345.000.

Smith, Edward F.: *See—*
Brock, Andrew J.; Smith, Edward F.; and Shapiro, Eugene, 4,612,166, Cl. 420-470.000.

Smith, Louis W., to GTE Communication Systems Corp. Toll restriction circuit for an electronic telephone station. 4,612,419, Cl. 179-90.00D.

Smith, Merrill M.; and Ferguson, Donald C., to American Biltrite Inc. Method for manufacturing a printed and embossed floor covering. 4,612,074, Cl. 156-85.000.

Smith, Somers H., III: *See—*
McCarty, George W.; and Smith, Somers H., III, 4,612,491, Cl. 320-2.000.

Smith, Wesley H.: *See—*
Betts, William L.; Smith, Wesley H.; and Deakley, Michael R., 4,612,509, Cl. 329-50.000.

SMW Schneider & Weisshaupt GmbH: *See—*
Hiestand, Karl, 4,611,814, Cl. 279-111.000.

Snow Brand Milk Products Co., Ltd.: *See—*
Hori, Tomoshige; Kako, Masatoshi; and Hiromichi, Hayashi, 4,611,928, Cl. 374-21.000.
Iwasaki, Taisuke; Honda, Yoshihiko; Nagaoka, Fumio; Aoki, Sadao; Horigome, Kazuo; and Imada, Ruyzo, 4,612,169, Cl. 422-32.000.

Snyder, Benjamin L., to Watsco, Inc. Line piercing valve assembly. 4,611,624, Cl. 137-318.000.

Socapex: *See—*
Soster, Marie C.; and Anastasie, Roger, 4,611,735, Cl. 225-96.500.

Societa' Pneumatici Pirelli Societa per Azioni: *See—*
Rimondi, Giovanni, 4,611,647, Cl. 152-209.00B.

S.A. Des Etablissements Staubli: *See—*
Truchet, Gaston, 4,611,831, Cl. 285-26.000.

Societe Chimique des Charbonnages S.A.: *See—*
Nicco, Adrien; Hubert, Jerome; Druz, Jacques; and Lambla, Morand, 4,612,349, Cl. 525-117.000.

Societe d'Exploitation des Ressorts Auto-Amortisseurs Jarret: *See—*
Jarret, Jean; and Jarret, Jacques, 4,611,792, Cl. 267-149.000.

Societe Nationale des Poudres et Explosifs: *See—*
Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., 4,612,143, Cl. 558-282.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Aubry, Jacques A.; and Bonfils, Michel R., 4,611,971, Cl. 416-114.000.

Soclof, Sidney I., to Rockwell International Corporation. Process for producing NPN type lateral transistors. 4,611,387, Cl. 29-576.00W.

Sodeco-Saia AG: *See—*
Polidoro, Roberto, 4,612,435, Cl. 235-144.0DM.

Solar, Jeffrey P.: *See—*
Muccigrosso, Deborah A.; Mares, Frank; Diamond, Steven E.; and Solar, Jeffrey P., 4,612,402, Cl. 568-408.000.

Solid State Chargers Research & Development Limited Partnership: *See—*
McCarty, George W.; and Smith, Somers H., III, 4,612,491, Cl. 320-2.000.

Somfy: *See—*
Jacquel, Dominique, 4,612,438, Cl. 250-206.000.

Sonnek, Werner, to Traub GmbH. Tool holder for machine tools. 4,611,383, Cl. 29-568.000.

Sony Corporation: *See—*
Ishikawa, Fumio; and Tanaka, Kuninobu, 4,612,464, Cl. 307-496.000.
Kaneda, Koji; and Sugiyama, Masayoshi, 4,612,244, Cl. 428-323.000.
Kaneko, Masahiko; and Tamada, Hitoshi, 4,612,587, Cl. 360-59.000.
Ohsato, Kiyoshi, 4,612,437, Cl. 250-201.000.
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, 4,612,627, Cl. 364-736.000.
Tsukahara, Nobuhiko, 4,612,588, Cl. 360-78.000.

Sood, Lal C., to Motorola, Inc. High speed input buffer having substrate biasing to increase the transistor threshold voltage for level shifting. 4,612,461, Cl. 307-475.000.

Sordello, Frank J.; and Rose, Andrew M., to Memorex Corporation. Method for measuring timing asymmetry in a magnetic storage system. 4,612,586, Cl. 360-31.000.

Sorlien, Mark D. Closable hanging vessel and method of use. 4,611,716, Cl. 206-581.000.

Soster, Marie C.; and Anastasie, Roger, to Socapex. Device for splitting at least one optical fibre. 4,611,735, Cl. 225-96.500.

Southern Door Company: *See*—
Williams, Harold L., 4,611,436, Cl. 49-425.000.

Spaargaren, Klaas; and Leyen, Adrianus C. W., to Shell Oil Company. U-shaped capacitor level gauge. 4,611,489, Cl. 73-304.00C.

Spath, Gunther; and Zeder, Werner, to U.S. Philips Corporation. Method of and test arrangement for testing the transmission path within an apparatus of a modular construction for interruptions. 4,612,421, Cl. 179-175.000.

Spaunhorst, Vernon: *See*—
Gurevich, Leon; and Spaunhorst, Vernon, 4,612,529, Cl. 337-255.000.

Spector, Donald. Reversible fragrance emitting unit. 4,612,223, Cl. 428-35.000.

Spector, George: *See*—
Stephens, Ceacer O.; and Spector, George, 4,611,576, Cl. 126-440.000.

Spencer, Byron A. T.: *See*—
Binns, John M.; Caine, Douglas A.; and Spencer, Byron A. T., 4,612,616, Cl. 364-431.020.

Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Magnetic length or angle measuring system having improved magnetic sensor arrangement. 4,612,502, Cl. 324-208.000.

Spies, Xaver: *See*—
Hegenstaller, Anton; and Spies, Xaver, 4,611,979, Cl. 425-376.00R.

Spivack, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. Tri- and tetra-(substituted hydroxyphenylthio) alkane and cycloalkane stabilizers. 4,612,341, Cl. 524-331.000.

Spivack, John D.: *See*—
Ravichandran, Ramanathan; and Spivack, John D., 4,612,393, Cl. 564-300.000.

Sprague Electric Company: *See*—
Macdougall, John D.; and Cooper, Richard B., 4,612,563, Cl. 357-40.000.

Springer, George P.: *See*—
Beauchamp, Robert W.; and Springer, George P., 4,612,628, Cl. 364-748.000.

Square D Company: *See*—
Clark, Michael R.; Tringali, Dominick; Woodlief, Fredrick E.; and Orosz, Miklos J., 4,612,424, Cl. 200-50.00A.
Sloan, Dallas; Venzke, Donald R.; and Wehr, Eugene, 4,612,430, Cl. 200-327.000.

Squires, Russell W.: *See*—
Caserta, Anthony L.; Squires, Russell W.; and Szuchy, Nicholas C., 4,611,378, Cl. 29-407.000.

SRI International: *See*—
Sanjurjo, Angel; and Pressacco, Sylvia, 4,612,179, Cl. 423-348.000.

SRM Svenska Rotor Maskiner Aktiebolag: *See*—
Muller-Odenwald, Hermann E., 4,612,024, Cl. 55-80.000.

SS Pharmaceutical Co., Ltd.: *See*—
Fukushi, Kazue, 4,612,304, Cl. 514-53.000.

Staab, Robert J., to Lancaster Colony Corporation. Display rack system for candles. 4,611,720, Cl. 211-60.100.

Staar Development Co. S.A.: *See*—
Staar, Marcel, 4,611,894, Cl. 352-114.000.

Staar, Marcel, to Staar Development Co. S.A. Device for direct cinematographic viewing of stereoscopic images on film with a sound track. 4,611,894, Cl. 352-114.000.

Stahl, Daniel E.: *See*—
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,611,878, Cl. 339-186.00M.

Stahura, Richard P., to Martin Engineering Company. Collection receptacle and method. 4,611,498, Cl. 73-864.410.

Standard Oil Company, The: *See*—
Currie, Janie K.; Cooper, Arthur J.; and Pesa, Frederick A., 4,612,301, Cl. 502-154.000.

Standard Oil Company (Indiana): *See*—
Kaplan, Richard D., 4,611,613, Cl. 134-95.000.
Kretchmer, Richard A.; and Hinrichs, Lansing M., 4,612,177, Cl. 423-244.000.

Stappaerts, Eddy A.: *See*—
Long, William H.; Stappaerts, Eddy A.; and Plummer, Michael J., 4,612,643, Cl. 372-38.000.

Star Seimitsu Kabushiki Kaisha: *See*—
Suzuki, Kenji, 4,612,446, Cl. 250-570.000.

Starck, Alexander: *See*—
Grallert, Hans-Joachim; and Starck, Alexander, 4,612,573, Cl. 358-140.000.

Starke, Richard J., to AT&T Bell Laboratories. CMOS dynamic circulating-one shift register. 4,612,659, Cl. 377-72.000.

Stasin, Howard R. Container incorporating an alarm. 4,611,924, Cl. 368-10.000.

Steadfast, Inc.: *See*—
Graham, Robert G., Jr., 4,611,439, Cl. 52-9.000.

Steckhan, Eberhard: *See*—
Degner, Dieter; Steckhan, Eberhard; and Grosse-Brinkhaus, Karl H., 4,612,092, Cl. 204-59.00R.

Steer, Peter L., to Craig Medical Products Limited. Tube closure device. 4,611,785, Cl. 251-4.000.

Stefani, Fabrizio; Cini, Carlo; and Alzati, Angelo, to SGS-ATES Componenti Elettronici SpA. Control circuit for the switching of inductive loads having a push-pull output stage. 4,612,452, Cl. 307-300.000.

Steffee, Arthur D., to Acromed Corporation. Apparatus for straightening spinal columns. 4,611,581, Cl. 128-69.000.

Stehlin, Albert: *See*—
Schafer, Paul; Abel, Heinz; Guth, Christian; and Stehlin, Albert, 4,612,352, Cl. 525-404.000.

Steidle, Gerhard, to Aesculap-Werke AG vormals Jetter & Scheerer. Motor-driven cutter for the cutting open of plaster casts. 4,611,585, Cl. 128-91.00A.

Stein, Alexander, to Exxon Research and Engineering Co. Pyrometer measurements in the presence of intense ambient radiation. 4,611,930, Cl. 374-126.000.

Stein, Paul J.: *See*—
Davis, Christopher K.; Stein, Paul J.; and Ball, Diana M., 4,612,637, Cl. 370-95.000.

Steinberg, Albert H.: *See*—
DellaVecchia, Michael P.; Mackey, Joseph E.; and Steinberg, Albert H., 4,612,238, Cl. 428-228.000.

Steklenski, David J.; and Keogh, Philip L., to Eastman Kodak Company. Protective overcoat for photographic elements. 4,612,279, Cl. 430-523.000.

Stelco Inc.: *See*—
Kelly, John H.; and Guest, Leonard E., 4,612,042, Cl. 75-24.000.

Stenkvist, Sven-Einar, to Asea AB. DC arc furnace. 4,612,650, Cl. 373-108.000.

Stepankova, Helena: *See*—
Drobnik, Jaroslav; and Stepankova, Helena, 4,612,009, Cl. 604-891.000.

Stephano & Co., Ltd.: *See*—
Sato, Masami, 4,612,200, Cl. 426-242.000.

Stephens, Ceacer O.; and Spector, George. Solar energy collector. 4,611,576, Cl. 126-440.000.

Stessen, Lothar, to Diehl GmbH & Co. Method of increasing the effectiveness of target-seeking ammunition articles. 4,611,772, Cl. 244-3.160.

Stevenson, Roy: *See*—
Hoffman, Michael E.; and Stevenson, Roy, 4,611,798, Cl. 270-31.000.

Stewart, Roger G., to RCA Corporation. High-speed output driver. 4,612,466, Cl. 307-585.000.

Stiegler, James O.: *See*—
Liu, Chain T.; and Stiegler, James O., 4,612,165, Cl. 420-459.000.

Stockhausen, Norbert, to Fogra Deutesche Forschungsgesselschaft fur Druck-und Reproduktionstechnik e.v. Method and apparatus for measuring and/or monitoring the surface tension of a fluid. 4,611,486, Cl. 73-64.400.

Stoll, Kurt; Heid, Georg; Schrag, Gerhard; and Wagner, Albrecht. Oscillating piston motor. 4,611,530, Cl. 92-13.500.

Stolle, Mark A.: *See*—
Hamacher, Edward N.; and Stolle, Mark A., 4,612,010, Cl. 604-207.000.

Stollenwerk, Margot, heir: *See*—
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, 4,612,365, Cl. 530-301.000.

Stollenwerk, Paul, heir: *See*—
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, 4,612,365, Cl. 530-301.000.

Stollenwerk, Ulrich, deceased: *See*—
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, 4,612,365, Cl. 530-301.000.

Stone, Carroll E. Process for treating metal halides and organo substituted metal halides with metal recovery. 4,612,176, Cl. 423-240.000.

Stone, Orison W., to Pack Image, Inc. Apparatus for erecting a bottle carrier. 4,611,712, Cl. 206-198.000.

Stoner, Donald W. Teaching machine. 4,611,996, Cl. 434-202.000.

Storage Technology Partners: *See*—
Tavares, Antonio; and Martin, Trevor, 4,611,399, Cl. 29-876.000.

Storberg, David G., to CPT Corporation. Linearity correction circuit. 4,612,481, Cl. 315-370.000.

Stout, Gregg W.; and Peterson, Elmer R., to Baker Oil Tools, Inc. Wireline conveyed firing mechanism for well perforating gun. 4,611,660, Cl. 166-297.000.

Strack, Helmut, to Siemens Aktiengesellschaft. Electronic switch. 4,612,448, Cl. 307-252.00G.

Strein, Klaus: *See*—
Leinert, Herbert; Kampe, Wolfgang; Strein, Klaus; Muller-Beckmann, Bernd; and Bartsch, Wolfgang, 4,612,313, Cl. 514-255.000.

Stricker, Peter A.; and Schweitzer, John J., to Vickers, Incorporated. Axial piston machine constructed in a removable cartridge form to facilitate assembly and disassembly. 4,611,529, Cl. 91-499.000.

Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Neuenschwander, Kent W., 4,612,309, Cl. 514-212.000.

Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, to ebm Elektrobau Mulfingen GmbH & Co. External rotor motor with clamped stator bushing. 4,612,468, Cl. 310-67.00R.

Suarez, Francis S.: *See*—
Ramsey, Cecil L.; and Suarez, Francis S., 4,612,164, Cl. 420-455.000.

Subramanyam, Dilip K.: *See*—
Larson, Hugo R.; and Subramanyam, Dilip K., 4,612,067, Cl. 148-329.000.

Sudimak, Michael J.: *See*—
Cohn, Robert J.; and Sudimak, Michael J., 4,611,718, Cl. 211-49.100.

Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, to 501 Juridical Foundation, The Chemo-Sero-Therapeutic Research Institute. Method for purification of HBs antigen. 4,612,283, Cl. 435-68.000.
Sugahara, Koichi: *See*—
Ashizaki, Shigeya; Natsuhara, Masao; Sugahara, Koichi; and Muranishi, Hideo, 4,612,474, Cl. 313-414.000.
Sugino, Paul S. Method and apparatus for analyzing ophthalmic elements and the like. 4,611,913, Cl. 356-127.000.
Sugita, Hiroshi: *See*—
Kanai, Makoto; Sugita, Hiroshi; and Kawai, Makoto, 4,612,425, Cl. 200-61.550.
Sugita, Takehiro; Sakamoto, Akira; Fukami, Takeshi; Komatsubara, Michimasa; and Shimizu, Akira, to Sony Corporation. Digital signal composing circuit for cross-fade signal processing. 4,612,627, Cl. 364-736.000.
Sugiyama, Masayoshi: *See*—
Kaneda, Koji; and Sugiyama, Masayoshi, 4,612,244, Cl. 428-323.000.
Sugiyama, Tetsuya: *See*—
Nagaoka, Makoto; and Sugiyama, Tetsuya, 4,612,433, Cl. 219-216.000.
Sullair Technology AB: *See*—
Schibbye, (Lars) Laurtiz B.; and Englund, Rolf A., 4,611,976, Cl. 418-159.000.
Sullivan, John T., to Navistar International Corporation. Inflatable and extendable vehicle skirt. 4,611,847, Cl. 296-1.00S.
Sulzer Brothers Limited: *See*—
Kagi, Ulrich, 4,612,490, Cl. 318-761.000.
Sulzer-Escher Wyss Limited: *See*—
Guttinger, Heinz, 4,611,479, Cl. 72-16.000.
Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor provided with a four-stroke engine. 4,611,559, Cl. 123-196.00A.
Sumitomo Chemical Company, Limited: *See*—
Kisida, Hirosi; and Yano, Toshihiko, 4,612,323, Cl. 514-394.000.
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, 4,612,394, Cl. 564-420.000.
Ooishi, Tadashi, 4,612,307, Cl. 514-147.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Matsuoka, Toshio; and Kurozu, Shinichi, 4,612,041, Cl. 75-10.140.
Sun, Yun C., to Dow Chemical Company, The. Rubber concentrate, polymer blends based thereon and methods for making same. 4,612,348, Cl. 525-86.000.
Sunahara, Shuichi: *See*—
Kato, Yoshito; Sunahara, Shuichi; Tanaka, Takayuki; and Takahashi, Hiroshi, 4,611,695, Cl. 118-323.000.
Sunds Defibrator AB: *See*—
Nardi, Franco, 4,612,088, Cl. 162-235.000.
Sundstrand Corporation: *See*—
Blain, Edward S., 4,611,975, Cl. 418-5.000.
Suska, Charles R. Overhead doors operating apparatus. 4,612,485, Cl. 318-5.000.
Sutherland, Robert L., to Federal Paper Board Co., Inc. Modified lock arrangement for cartons. 4,611,754, Cl. 229-40.000.
Suyama, Koji, to Yamaha Hatsudoki Kabushiki Kaisha. Automatic speed control system for motorcycles. 4,611,561, Cl. 123-360.000.
Suzuka, Susumu: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.
Suzuki, Fumio; Fujinuma, Makoto; Ohtake, Yasuhisa; and Inaba, Michihiko, to Kabushiki Kaisha Toshiba. Method of manufacturing picture tube shadow mask. 4,612,061, Cl. 148-6.350.
Suzuki, Hayato: *See*—
Yamauchi, Takao; Suzuki, Hayato; Iwabuchi, Osamu; and Kishimoto, Toshinobu, 4,612,495, Cl. 322-100.000.
Suzuki, Hiroshi: *See*—
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, 4,612,128, Cl. 252-32.500.
Suzuki, Kenji, to Star Seimitsu Kabushiki Kaisha. Web terminal detecting device. 4,612,446, Cl. 250-570.000.
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, to Konishiroku Photo Industry Co., Ltd.; Fuji Electric Company Ltd.; and Fuji Electric Corporate Research and Development Ltd. Range finder. 4,611,910, Cl. 356-1.000.
Suzuki, Mikio; and Matsumoto, Toshiyuki, to Mitutoyo Mfg. Co., Ltd. Digital indication type measuring apparatus. 4,612,656, Cl. 377-24.000.
Suzuki, Motoyuki: *See*—
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,612,539, Cl. 340-710.000.
Suzuki, Naomi: *See*—
Kojima, Ryuiji; Suzuki, Naomi; Sato, Yokichi; and Saito, Tsuneo, 4,612,060, Cl. 148-6.15Z.
Suzuki, Shota: *See*—
Yoshida, Masayuki; and Suzuki, Shota, 4,611,689, Cl. 187-29.00R.
Suzuki, Toshitake: *See*—
Hama, Fumio; Suzuki, Toshitake; and Kondo, Mitsuru, 4,612,557, Cl. 346-216.000.
Svensson, Kjell A. I.: *See*—
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.
Svoboda, Frantisek: *See*—
Werner, Heinz; Kluting, Bernd A.; Bertram, Klaus D.; and Svoboda, Frantisek, 4,611,778, Cl. 248-429.000.
Swiatkowski, Piotr, to Kenobel AB. Amidocarboxylic acids as flotation agents. 4,612,112, Cl. 209-166.000.
SWS Silicones Corporation: *See*—
Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., 4,612,055, Cl. 106-287.110.
Sylvester, Vito P.: *See*—
Morgan, Ricky D.; Sylvester, Vito P.; and Ward, Robert L., 4,612,162, Cl. 419-28.000.
Symbold, John. Simulated thatch roof shingles. 4,611,451, Cl. 52-555.000.
Synodis, Joseph: *See*—
Yeh, Kuo-Chen; and Synodis, Joseph, 4,612,191, Cl. 424-52.000.
Syntex (U.S.A) Inc.: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,612,325, Cl. 514-413.000.
Verheyden, Julien P. H.; and Martin, John C., 4,612,314, Cl. 514-261.000.
Syrowatka, Rupert: *See*—
Eustacchio, Peter; Perchthaler, Heinz; and Syrowatka, Rupert, 4,612,123, Cl. 210-709.000.
Szabo, Sandor; Usadel, Klaus W.; and Kessler, Horst, to Brigham and Women's Hospital. Clinical use of somatostatin analogues. 4,612,302, Cl. 514-11.000.
Szuchy, Nicholas C.: *See*—
Caserta, Anthony L.; Squires, Russell W.; and Szuchy, Nicholas C., 4,611,378, Cl. 29-407.000.
Tachikawa Spring Co., Ltd.: *See*—
Sakamoto, Takao, 4,611,783, Cl. 248-588.000.
Tada, Kazuhiro: *See*—
Kotera, Norio; Tada, Kazuhiro; Masaki, Shinzaburo; Goto, Kunihisa; and Kaneoya, Tatsuo, 4,612,394, Cl. 564-420.000.
Tagliamonte, Thomas A.: *See*—
DiBiase, Stephen A.; Davis, Kirk E.; and Tagliamonte, Thomas A., 4,612,129, Cl. 252-33.600.
Takada, Haruhiko: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,611,977, Cl. 418-76.000.
Takada, Shigeyuki: *See*—
Yamamoto, Masaki; and Takada, Shigeyuki, 4,612,364, Cl. 528-491.000.
Takahashi, Harumi, to Ricoh Company, Ltd. Device for detecting momentary cutoff of AC power source. 4,612,657, Cl. 377-32.000.
Takahashi, Hiroshi: *See*—
Kato, Yoshito; Sunahara, Shuichi; Tanaka, Takayuki; and Takahashi, Hiroshi, 4,611,695, Cl. 118-323.000.
Takahashi, Osamu: *See*—
Sato, Yoshiaki; and Takahashi, Osamu, 4,611,937, Cl. 400-208.000.
Takahashi, Yohji: *See*—
Matukuma, Akira; Takahashi, Yohji; and Kondo, Yoshihiko, 4,612,327, Cl. 514-479.000.
Takamura, Tomoe: *See*—
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, 4,612,127, Cl. 252-32.500.
Takasago Perfumery Co., Ltd.: *See*—
Sato, Toshiya; Asano, Kenichi; and Yamaguchi, Yuzo, 4,612,190, Cl. 424-49.000.
Takase, Osamu; and Kuroyanagi, Tomomitsu, to Hitachi, Ltd. Chrominance signal recording and reproducing apparatus. 4,612,585, Cl. 358-316.000.
Takata, Hideyuki: *See*—
Kosugi, Seiji; and Takata, Hideyuki, 4,611,631, Cl. 137-625.650.
Takatori Machinery Mfg. Co., Ltd.: *See*—
Nishikawa, Masao; and Naohara, Michikazu, 4,611,733, Cl. 223-75.000.
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, to Fujisawa Pharmaceutical Co., Ltd. Substituted-3,4-dihydro-4-(2,4,6-trimethoxyphenylimino)-2(1H)-pyrimidones useful as cardiotonic, antihypertensive, cerebrovascular vasodilator and anti-platelet agent. 4,612,376, Cl. 544-317.000.
Takayama, Hidehiko: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,611,977, Cl. 418-76.000.
Takayama, Hiroki: *See*—
Motojima, Hideaki; Takayama, Hiroki; and Ohura, Jun-ichi, 4,612,562, Cl. 357-38.000.
Takeda Chemical Industries: *See*—
Yamamoto, Masaki; and Takada, Shigeyuki, 4,612,364, Cl. 528-491.000.
Takeda Chemical Industries, Inc.: *See*—
Terao, Shinji; and Maki, Yoshitaka, 4,612,321, Cl. 514-338.000.
Takeda, Hirofumi, to MMT Inc. Machine for pull-on and pull-out of dampener cover of offset printing press. 4,611,376, Cl. 29-235.000.
Takeda, Hiromitsu: *See*—
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.
Takeda, Hisao; and Taniguchi, Yasunori, to American Colloid Company. Production process for highly water absorbable polymer. 4,612,250, Cl. 428-500.000.

Takeda Riken Kogyo Kabushikikaisha: *See*—
Hayashi, Mishio, 4,611,926, Cl. 368-120.000.

Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, to Tamura Electric Works, Ltd. Method for controlling task process and device thereof. 4,612,418, Cl. 179-81.00R.

Takeda, Yukio: *See*—
Shigaki, Masafumi; and Takeda, Yukio, 4,612,514, Cl. 330-277.000.

Takenoya, Hideaki; and Mishima, Fumiyuki, to Janome Sewing Machine Co., Ltd. Printer of the dot impact type. 4,611,940, Cl. 400-649.000.

Takeuchi, Kazuhiko: *See*—
Nakamura, Kazuharu; Mito, Yoshio; and Takeuchi, Kazuhiko, 4,611,574, Cl. 126-201.000.

Takeuchi, Kiyoshi, to Nissan Motor Co., Ltd. Angular acceleration sensor. 4,611,490, Cl. 73-505.000.

Takeuchi, Tomio: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.

Talboy, Glenn E. Clamp for holding surgical lines. 4,611,592, Cl. 128-321.000.

TAM Ceramics Inc.: *See*—
Hodgkins, Charles E., 4,612,600, Cl. 361-321.000.

Tamada, Hitoshi: *See*—
Kaneko, Masahiko; and Tamada, Hitoshi, 4,612,587, Cl. 360-59.000.

Tamura Electric Works, Ltd.: *See*—
Takeda, Yoshiaki; Oyamada, Takashi; Hayasaka, Toshiaki; Kai, Osamu; and Kubota, Toshimichi, 4,612,418, Cl. 179-81.00R.

Tamura, Tatsuo: *See*—
Saito, Junichi; and Tamura, Tatsuo, 4,612,385, Cl. 560-12.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,612,317, Cl. 514-292.000.

Tanabe, Tsutomu: *See*—
Kumagai, Atsushi; Tanabe, Tsutomu; and Yasunaga, Hirokazu, 4,612,260, Cl. 428-667.000.

Tanahashi, Toshio: *See*—
Yoshizaki, Kouji; and Tanahashi, Toshio, 4,611,558, Cl. 123-90.160.

Tanaka, Kiyoji: *See*—
Chiba, Kazumasa; and Tanaka, Kiyoji, 4,612,346, Cl. 525-66.000.

Tanaka, Kuninobu: *See*—
Ishikawa, Fumio; and Tanaka, Kuninobu, 4,612,464, Cl. 307-496.000.

Tanaka, Shigeru: *See*—
Maruyama, Tutomu; Nakagawa, Norikazu; Hosokawa, Tsuyoshi; Sakayori, Yuji; Tanaka, Shigeru; and Oomatsu, Yoshiya, 4,612,201, Cl. 426-511.000.

Tanaka, Shinsaku; and Yoshimura, Toshio, to Tanashin Denki Co., Ltd. Cassette tape recorder with rotary actuated ejection. 4,612,591, Cl. 360-93.000.

Tanaka, Shinsuke; and Imamura, Nobutake, to Kokusai Denshin Denwa Co., Ltd. Magneto-optical recording medium. 4,612,068, Cl. 148-301.000.

Tanaka, Takayuki: *See*—
Kato, Yoshito; Sunahara, Shuichi; Tanaka, Takayuki; and Takahashi, Hiroshi, 4,611,695, Cl. 118-323.000.

Tanaka, Yasuzo; and Furuto, Yoshio, to Furukawa Electric Co., Ltd., The. Method of manufacturing superconducting compound stranded cable. 4,611,390, Cl. 29-599.000.

Tanaka, Yoshiaki: *See*—
Inami, Mamoru; and Tanaka, Yoshiaki, 4,612,665, Cl. 381-98.000.

Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku; and Yoshimura, Toshio, 4,612,591, Cl. 360-93.000.

Tang, Ping W.: *See*—
Lau, Philip; and Tang, Ping W., 4,612,278, Cl. 430-381.000.

Taniguchi, Yasunori: *See*—
Takeda, Hisao; and Taniguchi, Yasunori, 4,612,250, Cl. 428-500.000.

Taniguchi, Yutaka, to Fuji Photo Film Co., Ltd. Method of making light guide member. 4,612,144, Cl. 264-1.500.

Tanimoto, Shigemi: *See*—
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,611,790, Cl. 266-235.000.

Tanno, Masuo; and Yamada, Yuichiro, to Matsushita Electric Industrial Co., Ltd. Reactive ion etching method. 4,612,099, Cl. 204-92.320.

Tappan Company, The: *See*—
Ravinet, Ernest, 4,611,841, Cl. 292-241.000.

Tarantino, John L. Selectable entry shellfish trap. 4,611,424, Cl. 43-100.000.

Tardy, Rene : *See*—
Benaben, Patrick; and Tardy, Rene , 4,612,091, Cl. 204-51.000.

Tate & Lyle Public Limited Co.: *See*—
Khan, Riaz A.; Mufti, Khisar S.; and Patel, Gita D., 4,612,373, Cl. 536-120.000.

Tatsuno, Kimio: *See*—
Hongou, Jinichi; Homma, Yoshifumi; Ito, Shoichi; and Tatsuno, Kimio, 4,612,555, Cl. 346-160.000.

Tatum, Sammy D.: *See*—
Heinemeyer, Ben W.; and Tatum, Sammy D., 4,612,156, Cl. 264-176.00R.

Tavares, Antonio; and Martin, Trevor, to Storage Technology Partners. Connector pin alignment tool and method for aligning. 4,611,399, Cl. 29-876.000.

Tawada, Yoshihisa: *See*—
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,612,409, Cl. 136-244.000.

Tawara, Katsuya: *See*—
Ogata, Masaru; Matsumoto, Hiroshi; Kida, Shiro; and Tawara, Katsuya, 4,612,322, Cl. 514-383.000.

Tayco Developments, Inc.: *See*—
Taylor, Paul H., 4,611,794, Cl. 267-64.130.

Taylor, Graham: *See*—
Jones, Keith; Lothian, Barry R.; Martin, Alexander; Taylor, Graham; and Haq, Zia, 4,612,334, Cl. 521-146.000.

Taylor, Henry D.: *See*—
Nanda, Vinod K.; and Taylor, Henry D., 4,611,528, Cl. 91-442.000.

Taylor, Paul H., to Tayco Developments, Inc. Tension-compression liquid spring unit. 4,611,794, Cl. 267-64.130.

Teagle, David A.: *See*—
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,612,266, Cl. 429-221.000.

Tecnomare S.p.A.: *See*—
Di Tella, Vincenzo; Brandi, Roberto; and Carraro, Roberto, 4,611,550, Cl. 114-230.000.

Tecseat Ltd.: *See*—
Noyes, Howard B.; and Aelion, Rene, 4,611,851, Cl. 297-199.000.

Tegal Corporation: *See*—
Brooks, Edward A., Jr.; and Bithell, Roger M., 4,611,919, Cl. 356-357.000.

Tegge, Edward H., Jr.: *See*—
Beamon, William S., III; and Tegge, Edward H., Jr., 4,612,482, Cl. 315-371.000.

Teig, Carl W. Multiple and storable wind instrument mute holder. 4,611,722, Cl. 211-107.000.

Tektronix, Inc.: *See*—
Buzak, Thomas S., 4,611,889, Cl. 350-337.000.
Eby, David H., 4,612,658, Cl. 377-52.000.
Ireland, Thomas M.; Koller, Thomas J.; and Lancaster, Michael T., 4,611,777, Cl. 248-371.000.

Telebyte Corportion: *See*—
Bacon, Francis L.; and Houde, Donald J., 4,612,532, Cl. 340-347.0DD.

Temcor: *See*—
Richter, Donald L., 4,611,442, Cl. 52-81.000.

Temper-Ring Equipment Corporation: *See*—
Rode, John E., 4,611,935, Cl. 384-548.000.

Ten Eyck, John D., to Kennecott Corporation. Method of producing seamless ceramic fiber composite articles. 4,612,087, Cl. 162-129.000.

Tengs, Anthony M.; and Gilbert, Edna M. Invisible Christmas tree. 4,612,219, Cl. 428-8.000.

Terao, Shinji; and Maki, Yoshitaka, to Takeda Chemical Industries, Inc. 5-pyridyl-1,3-thiazole derivatives. 4,612,321, Cl. 514-338.000.

Terracciano, Flora. Punching unit in a punching and/or binding machine for joining together a pack of sheets by a comb binder. 4,611,520, Cl. 83-549.000.

Terry, Chris E. Exercise device for back and spine. 4,611,806, Cl. 272-144.000.

Texaco, Inc.: *See*—
Cuscurida, Michael; and Klein, Howard P., 4,612,335, Cl. 521-167.000.
Patel, Jitendra A., 4,611,921, Cl. 366-156.000.
Renken, Terry L., 4,612,397, Cl. 564-479.000.

Texas Instruments Incorporated: *See*—
Andresen, Bernhard H.; and Keeney, Stanley C., 4,612,499, Cl. 324-73.00R.
Jelks, Edward C.; and Melloch, Michael R., 4,612,085, Cl. 156-643.000.
Prater, Cordell E., 4,612,457, Cl. 307-443.000.
Westphal, Glenn H.; and Sherer, Jimmie B., 4,612,082, Cl. 156-607.000.

Thaer, Andreas: *See*—
Heitmann, Knut; Hoppe, Martin; Schneider, Eckhard; and Thaer, Andreas, 4,612,267, Cl. 430-3.000.

Tharp, Emery C. Reciprocating bulldozer blade. 4,611,667, Cl. 172-40.000.

Thaxton, Inc.: *See*—
Leslie, Bruce E., 4,611,485, Cl. 73-49.800.

Thedford, Russell E., deceased (by Thedford, Russell E., executor), to Acme Fence and Iron Company, Inc. Method of making a fence stretcher bar. 4,612,063, Cl. 148-12.00B.

Thedford, Russell E., executor: *See*—
Thedford, Russell E., deceased, 4,612,063, Cl. 148-12.00B.

Theeuwes, Felix: *See*—
Wong, Patrick S. L.; Barclay, Brian; Deters, Joseph C.; and Theeuwes, Felix, 4,612,008, Cl. 604-892.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast cleaning method and machine. 4,611,541, Cl. 104-2.000.

Third, Sinclair M.; and Abel, Edward, to United Kingdom Atomic Energy Authority. Electric power transfer system. 4,612,527, Cl. 336-5.000.

Thomas, Harold K., to Corban International, Ltd. Process for refining brass and aluminum scraps. 4,612,168, Cl. 420-587.000.

Thomas, Richard D.: *See*—
Compton, Stephen F.; and Thomas, Richard D., 4,611,728, Cl. 221-63.000.

Thomsen, Jack W., to Oliver, Bruce J. Combination seat and seal device. 4,611,788, Cl. 251-363.000.
Thomson CSF: *See—*
Brucker, Jean-Michel; and Estang, Bernard, 4,612,550, Cl. 343-756.000.
Dortu, Jean-Marc; and Kohn, Erhard, 4,612,560, Cl. 357-22.000.
Thorpe, Donald H.: *See—*
Ginter, James W.; Thorpe, Donald H.; and Cooke, Victor F. G., 4,612,254, Cl. 428-531.000.
Thrap-Olsen, Olav. Burner for particulate fuel. 4,611,544, Cl. 110-341.000.
Thrash, Robert J.: *See—*
Connolly, John F.; Thrash, Robert J.; and Kretchmer, Richard A., 4,612,265, Cl. 429-196.000.
Thyagarajan, Budalur S. Process for treatment of fluids contaminated with polychlorinated biphenyls. 4,612,404, Cl. 568-730.000.
Thyssen Aktiengesellschaft: *See—*
Luckow, Herbert; Plantikow, Ulrich; and Grone, Siegfried, 4,611,751, Cl. 228-184.000.
Tiberg, Lars A.: *See—*
Bernstein, Ragnar L. H.; and Tiberg, Lars A., 4,611,652, Cl. 165-1.000.
Titoff, Juha, to Enso-Gutzeit Oy. Floating bed reactor. 4,612,115, Cl. 210-189.000.
Tobacco Research and Development Institute Limited: *See—*
Meiring, Willem J., 4,611,676, Cl. 177-50.000.
Toho Titanium Co., Ltd.: *See—*
Koizumi, Masaaki; Fukada, Nobuo; and Okano, Hiroyuki, 4,612,040, Cl. 75-10.650.
Tokai Electric Wire Company Limited: *See—*
Ito, Katsuya; and Yamada, Shinichi, 4,611,872, Cl. 339-94.00M.
Tokai Rubber Industries Ltd.: *See—*
Matsuoka, Mitsuyuki; and Ohnishi, Masanobu, 4,611,832, Cl. 285-55.000.
Tokuno, Masateru; and Sawada, Tetsuya, to Rengo Co., Ltd. Die cutting apparatus. 4,612,006, Cl. 493-342.000.
Tokyo Electric Co., Ltd.: *See—*
Norigoe, Takashi, 4,611,393, Cl. 29-602.00R.
Tokyo Keiki Co., Ltd.: *See—*
Komachi, Taichi, 4,611,496, Cl. 73-861.270.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Asano, Masamichi; and Iwahashi, Hiroshi, 4,612,462, Cl. 307-482.000.
Enjoji, Susumu; and Ishiyama, Kazufumi, 4,611,372, Cl. 29-25.350.
Fukushi, Yukihiro, 4,611,903, Cl. 355-14.00R.
Homma, Mitsuo, 4,611,914, Cl. 356-141.000.
Komatsu, Kenichi; and Honda, Michitaka, 4,612,572, Cl. 358-111.000.
Masuoka, Fujio; and Iizuka, Hisakazu, 4,612,212, Cl. 427-91.000.
Ochii, Kiyofumi, 4,612,631, Cl. 365-203.000.
Ohnishi, Yoshiichi, 4,612,541, Cl. 340-825.050.
Tomasic, Nicholas A.: *See—*
Maier, Alfred E.; Farley, James R.; and Tomasic, Nicholas A., 4,612,426, Cl. 200-144.00R.
Tomita, Yoshifumi: *See—*
Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, 4,612,268, Cl. 430-28.000.
Tomiyasu, Hiroshi; Hattori, Masahiro; and Itoh, Yoshio, to Sankyo Dengyo Co. Ltd. Method and apparatus for controlling a grinding mill. 4,611,763, Cl. 241-30.000.
Tomy Kogyo Co. Inc.: *See—*
Kakizaki, Katsumi; and Ajiro, Yutaka, 4,612,472, Cl. 310-339.000.
Tonel, Valerio, to Nordica S.p.A. Device for adjusting flex in ski boots and the like. 4,611,415, Cl. 36-120.000.
Tong, Brian P.: *See—*
Cashin, Colin H.; Roberts, Noel A.; and Tong, Brian P., 4,612,324, Cl. 514-400.000.
Toor, Yair: *See—*
George, Harvey F.; and Toor, Yair, 4,612,584, Cl. 358-299.000.
Toray Industries, Inc.: *See—*
Chiba, Kazumasa; and Tanaka, Kiyoji, 4,612,346, Cl. 525-66.000.
Kato, Hiroyasu; and Yagi, Kenkichi, 4,612,228, Cl. 428-151.000.
Toshimichi, Yasujima, to King Tsushin Kogyo Kabushiki Kaisha. Passive infrared intrusion detection system. 4,612,442, Cl. 250-353.000.
Toumani, Rouben, to AT&T Bell Laboratories. Electronic battery feed circuit for telephone systems. 4,612,417, Cl. 179-77.000.
Toya Soda Manufacturing Co., Ltd.: *See—*
Kasai, Kiyoshi; Tsukidate, Takaaki; Nagata, Shinji; and Arakawa, Toshihiko, 4,612,297, Cl. 501-97.000.
Okuzono, Shuichi; Oda, Yasuhiro; Shintani, Takashi; and Emura, Noriaki, 4,612,343, Cl. 524-547.000.
Toyo Denka Kogyo Co., Ltd.: *See—*
Kamata, Toshihiko; Izumi, Shunji; Irimajiri, Kazuo; and Edagawa, Setsuji, 4,611,810, Cl. 273-218.000.
Toyoda Gosei Co., Ltd.: *See—*
Kanai, Makoto; Sugita, Hiroshi; and Kawai, Makoto, 4,612,425, Cl. 200-61.550.
Toyoda, Kazuo: *See—*
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,611,790, Cl. 266-235.000.
Toyota Jidosha Kabushi Kaisha: *See—*
Kato, Yuuichi; Ugajin, Mitsuyuki; and Kawakita, Tatsuya, 4,611,465, Cl. 60-602.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Fujikawa, Yoshihiro, 4,611,850, Cl. 296-201.000.
Kato, Yoshito; Sunahara, Shuichi; Tanaka, Takayuki; and Takahashi, Hiroshi, 4,611,695, Cl. 118-323.000.
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,611,562, Cl. 123-440.000.
Nishiyama, Kazuo; Mishima, Yasuhiro; and Kuwayama, Kiyoaki, 4,611,793, Cl. 267-52.000.
Onaka, Hidemi; Baika, Toyokazu; Shibata, Yoshiaki; Horii, Kingo; and Sato, Yasushi, 4,611,568, Cl. 123-559.000.
Otsuki, Hiromi; Matsuura, Ryoichi; Hori, Shinichi; Fujinami, Hiroshi; Oka, Hiroyuki; and Nomura, Yoshihisa, 4,611,859, Cl. 303-100.000.
Sasage, Yoshihiro; Ooka, Naoto; and Oohashi, Kaoru, 4,611,815, Cl. 280-6.00R.
Yoshizaki, Kouji; and Tanahashi, Toshio, 4,611,558, Cl. 123-90.160.
Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu; Mito, Yoshio; and Takeuchi, Kazuhiko, 4,611,574, Cl. 126-201.000.
Tracy, David H.; and Smith, Donald L., to Perkin-Elmer Corporation, The. Electrode for plasma etching system. 4,612,077, Cl. 156-345.000.
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., to United States of America, Air Force. Cargo handling system. 4,611,816, Cl. 280-43.200.
Trambarulo, Ralph F.: *See—*
Gans, Michael J.; Schneider, Martin V.; and Trambarulo, Ralph F., 4,612,518, Cl. 332-21.000.
Transamerica Delaval Inc.: *See—*
Bowman, Ronald, 4,611,601, Cl. 128-673.000.
Traub GmbH: *See—*
Sonnek, Werner, 4,611,383, Cl. 29-568.000.
Trenkler, Werner, to Dr.Ing. h.c.F. Porsche AG. Convertible top with interchangeable flexible and rigid rear windows for a passenger motor vehicle. 4,611,849, Cl. 296-201.000.
Tressler, Duane W.; and McLeod, J. C. Automatic ball throwing machine. 4,611,571, Cl. 124-7.000.
Tri-Mark Metal Corporation: *See—*
Sampey, Ronald W., 4,612,025, Cl. 55-223.000.
Tringali, Dominick: *See—*
Clark, Michael R.; Tringali, Dominick; Woodlief, Fredrick E.; and Grosz, Miklos J., 4,612,424, Cl. 200-50.00A.
Trinkley, Kim W. Food peeler. 4,611,532, Cl. 99-628.000.
Trio Kabushiki Kaisha: *See—*
Naito, Michinori; and Miyamoto, Shigeru, 4,612,511, Cl. 329-124.000.
Tritec, Inc.: *See—*
Beers, Howard L., 4,611,870, Cl. 339-75.0MP.
Triumph Adler AG: *See—*
Rettke, Wilfried; and Tunys, Ladislav, 4,611,938, Cl. 400-212.000.
Truchet, Gaston, to S.A. Des Etablissements Staubli. Connection device for simultaneously connecting a series of circuits. 4,611,831, Cl. 285-26.000.
Truitt, Gary A.: *See—*
Baggiolini, Enrico G.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,612,308, Cl. 514-167.000.
TRW Inc.: *See—*
Powell, Jack; and Liatsos, Charles E., 4,612,512, Cl. 330-66.000.
TRW Repa GmbH: *See—*
Wier, Franz, 4,611,369, Cl. 24-642.000.
Tsang, Juine-Kai, to Zilog, Inc. Method for thermally oxidizing polycide substrates in a dry oxygen environment and semiconductor circuit structures produced thereby. 4,612,258, Cl. 428-620.000.
Tsubakimoto Chain Co.: *See—*
Mitsufuji, Takashi, 4,611,710, Cl. 198-803.010.
Tsuboi, Norio; Furukawa, Noboru; and Miyazawa, Sadayuki, to Konishiroku Photo Industry Co., Ltd. Ultrasonic debubbling method and apparatus. 4,612,018, Cl. 55-15.000.
Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Device for measuring extremely diminished intensity of light. 4,611,920, Cl. 356-318.000.
Tsuge, Kazunori: *See—*
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,612,409, Cl. 136-244.000.
Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Demand estimation apparatus. 4,612,624, Cl. 364-581.000.
Tsuji, Shuya; Kawabata, Yoshichika; and Yamamoto, Rokuro, to Dai Nihon Ink Kagaku Kogyo Kabushiki Kaisha; and Yamamoto Kogyo Kabushiki Kaisha. Fiber reinforced thermosetting resin cylindrical shape product manufacturing apparatus. 4,611,980, Cl. 425-435.000.
Tsukahara, Nobuhiko, to Sony Corporation. Head moving apparatus using stepping motor. 4,612,588, Cl. 360-78.000.
Tsukidate, Takaaki: *See—*
Kasai, Kiyoshi; Tsukidate, Takaaki; Nagata, Shinji; and Arakawa, Toshihiko, 4,612,297, Cl. 501-97.000.
Tsukiji, Norio: *See—*
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.
Tsukui, Tsutomu; Shimizu, Toshio; and Doi, Ryouta, to Hitachi, Ltd. Fuel cell battery using acidic electrolyte. 4,612,261, Cl. 429-13.000.
Tsunekawa, Tokuichi: *See—*
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,612,454, Cl. 307-311.000.
Tsutsui, Shinji, to Canon Kabushiki Kaisha. Cassette-type container for a sheet-like member. 4,611,967, Cl. 414-411.000.

Tsutsumi, Takashi: *See*—
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.
Tucker, Arthur R., to Electronic Systems Products Inc. Liquid cooled cathode ray tube assembly for video image projection systems. 4,612,582, Cl. 358-237.000.
Tucker, Kenneth W.: *See*—
Joo , Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,611,396, Cl. 29-623.500.
Tunys, Ladislav: *See*—
Rettke, Wilfried; and Tunys, Ladislav, 4,611,938, Cl. 400-212.000.
Turner, James J.; and Waryu, Joseph C., to Nordson Corporation. Airless spray gun having tip discharge resistance. 4,611,762, Cl. 239-708.000.
Tusco Manufacturing Company: *See*—
Everett, Lynn E., 4,611,866, Cl. 312-257.00R.
Twieg, Robert J.: *See*—
Hofer, Donald C.; LaVergne, Debra B.; Twieg, Robert J.; and Volksen, Willi, 4,612,210, Cl. 427-82.000.
Tyros, James C. Olive picker with speed control and selected picker dimensions. 4,611,461, Cl. 56-328.00R.
Uchiyama, Susumu, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus using digital control. 4,611,494, Cl. 73-626.000.
Ueda, Fumihide, to Asahi Kasei Kogyo Kabushiki Kaisha. Titanium clad steel plate. 4,612,259, Cl. 428-661.000.
Uekido, Kouzou: *See*—
Ichimura, Yoshiaki; Endoh, Hiroshi; Saruwatari, Yoshihiko; and Uekido, Kouzou, 4,611,867, Cl. 339-14.00R.
Uematsu, Takao; Komatsuzaki, Shigeki; Takamura, Tomoe; Nakano, Fumio; and Narahara, Toshikazu, to Hitachi, Ltd. Lubricant for metal forming and process for metal forming. 4,612,127, Cl. 252-32.500.
Uematsu, Takao; Suzuki, Hiroshi; Komatsuzaki, Shigeki; and Nakano, Fumio, to Hitachi, Ltd. Lubricant for plastic working of metals. 4,612,128, Cl. 252-32.500.
Uemura, Fumiko: *See*—
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,612,384, Cl. 558-198.000.
Ueno, Yasushi: *See*—
Nishio, Hiroaki; Ueno, Yasushi; and Harada, Jun, 4,612,163, Cl. 419-68.000.
Ugajin, Mitsuyuki: *See*—
Kato, Yuuichi; Ugajin, Mitsuyuki; and Kawakita, Tatsuya, 4,611,465, Cl. 60-602.000.
Uhlemann, Reinhard; and Oster, Walter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for controlling the directional orientation of a radiation receiver device to a light source. 4,612,488, Cl. 318-582.000.
Ulmer, Harry E.: *See*—
Gupton, Frank; and Ulmer, Harry E., 4,612,389, Cl. 562-513.000.
Ulmer, Richard W., to Motorola, Inc. MOS current limiting output circuit. 4,612,497, Cl. 323-315.000.
Ulsenheimer, Horst: *See*—
Hofmann, Heinrich; and Ulsenheimer, Horst, 4,611,933, Cl. 384-512.000.
Umezawa, Hamao: *See*—
Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,371, Cl. 536-6.400.
Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, 4,612,372, Cl. 536-7.100.
Umezawa. Iwao; and Komiyama, Kanki, to Kitasato Institute. Novel antitumor antibiotic awamycin and its production. 4,612,285, Cl. 435-128.000.
Union Carbide Corporation: *See*—
Biel, Edward N.; and Kirkpatrick, George F., 4,612,221, Cl. 428-35.000.
D'Silva, Themistocles D., 4,612,326, Cl. 514-443.000.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,612,406, Cl. 585-329.000.
Union Oil Company of California: *See*—
Landry, James F.; Croudace, Michael C.; On, Harry P., Jr.; and Shen, Sidney Y., 4,612,130, Cl. 252-39.000.
United Kingdom Atomic Energy Authority: *See*—
Third, Sinclair M.; and Abel, Edward, 4,612,527, Cl. 336-5.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State in Her Britannic Majesty's Government of the: *See*—
Fairwood, Raymond S.; and Weal, Bryan J., 4,612,264, Cl. 429-114.000.
United States of America
Agriculture: *See*—
Dickerson, Willard A., 4,611,425, Cl. 43-121.000.
Air Force: *See*—
Evans, William P., 4,612,533, Cl. 340-347.0CC.
Gillard, Calvin W.; Buholz, Neal E.; and Wells, William M., III, 4,611,915, Cl. 356-349.000.
Traister, Martin S.; Fay, James R.; Becher, Charles E.; Calligeros, John M.; Harris, Foster R.; Powderly, Kevin M.; and Nicholson, Joseph M., 4,611,816, Cl. 280-43.200.
Army: *See*—
Brown, C. David, 4,611,993, Cl. 434-21.000.
Gibbons, John P.; and Powell, Rex B., 4,611,771, Cl. 244-3.120.
Jasper, Louis J., Jr.; De Santis, Charles M.; and Baxendale, James F., 4,612,476, Cl. 315-3.600.
Pardes, Herman; and Mills, William J., 4,612,441, Cl. 250-342.000.
Weiner, Maurice; Carter, John L.; and Youmans, Robert J., 4,612,455, Cl. 307-419.000.
Energy: *See*—
Cline, Carl F., 4,612,161, Cl. 419-3.000.
Harkness, John B. L.; Doctor, Richard D.; and Wingender, Ronald J., 4,612,175, Cl. 423-235.000.
Kramer, Daniel P.; and Massey, Richard T., 4,612,029, Cl. 65-59.240.
Liu, Chain T.; and Stiegler, James O., 4,612,165, Cl. 420-459.000.
Schmidt, Frederick A.; Peterson, David T.; and Wheelock, John T., 4,612,047, Cl. 420-83.000.
Sikka, Vinod K., 4,612,070, Cl. 148-127.000.
Zerr, Bruce A., 4,612,646, Cl. 372-58.000.
Health and Human Services: *See*—
Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., 4,612,315, Cl. 514-263.000.
Schlom, Jeffrey; Colcher, David; Nuti, Marianna; Hand, Patricia H.; and Austin, Faye, 4,612,282, Cl. 435-68.000.
National Aeronautics and Space Administration: *See*—
Morrison, Andrew D.; and Daud, Taher, 4,612,072, Cl. 148-175.000.
Navy: *See*—
Abebe, Moges; Burns, William K.; and Villarruel, Carl A., 4,612,028, Cl. 65-4.200.
DeVries, James M., 4,612,543, Cl. 343-5.00R.
Holyer, Ronald J., 4,611,929, Cl. 374-124.000.
Huang, Huey W., 4,612,660, Cl. 378-44.000.
King, William J., 4,612,666, Cl. 382-32.000.
Meunier, Hubert G., 4,612,213, Cl. 427-126.600.
Whitney, Wayne T.; and Hara, Hiroshi, 4,612,642, Cl. 372-33.000.
U.S. Philips Corporation: *See*—
Da Silva, Jean P. X.; and Guiglini, Jean-Yves M., 4,612,544, Cl. 343-5.0DP.
Davis, Christopher K.; Stein, Paul J.; and Ball, Diana M., 4,612,637, Cl. 370-95.000.
Defeuilley, Jean-Pierre; and Nguyen-van-Nguyen, Jean, 4,612,516, Cl. 331-11.000.
Gloaguen, Gilbert Y. M.; and Moussie, Michel, 4,612,460, Cl. 307-475.000.
Groothoff, Adriaan J., 4,612,524, Cl. 335-210.000.
Kleefstra, Marcus; Montagne, Antonius J. M.; and Pathuis, Jan W., 4,612,521, Cl. 333-165.000.
Nieuwendijk, Joris A. M.; and Van Gijsel, Wilhelmus D. A. M., 4,612,420, Cl. 179-115.5PV.
Robert, Serge; Cahart, Olivier F.; and Le Marchant, Pierre, 4,612,413, Cl. 178-22.080.
Seevinck, Evert, 4,612,513, Cl. 330-261.000.
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,612,525, Cl. 335-213.000.
Spath, Gunther; and Zeder, Werner, 4,612,421, Cl. 179-175.000.
Washington, Derek, 4,612,483, Cl. 315-376.000.
Zijlstra, Hinne, 4,612,505, Cl. 324-318.000.
United States Steel Corporation: *See*—
Box, William A., 4,612,120, Cl. 210-512.100.
United Technologies Automotive, Inc.: *See*—
Schnelle, Steven H.; Wood, Richard D.; and Weicht, Charles E., 4,611,374, Cl. 29-157.10R.
United Technologies Corporation: *See*—
Hetzer, Frederick C.; and Miller, Guy W., 4,611,464, Cl. 60-39.161.
May, James D.; and Gosselin, Charles E., 4,612,622, Cl. 364-560.000.
Universal Instruments Corporation: *See*—
Janisiewicz, Stanley W.; and Lovell, Edward J., 4,611,397, Cl. 29-834.000.
University of California, The Regents of the: *See*—
Hunt, C. Anthony, 4,612,370, Cl. 536-5.000.
Usadel, Klaus W.: *See*—
Szabo, Sandor; Usadel, Klaus W.; and Kessler, Horst, 4,612,302, Cl. 514-11.000.
Ushida, Susumu, to Alps Electric Co., Ltd. High-frequency circuit device with an annular capacitor on the back of an insulated substrate. 4,611,882, Cl. 357-80.000.
Ushijima, Takao; and Noguchi, Takeshi, to Bridgestone Corporation. Vibration isolating apparatus. 4,611,782, Cl. 248-562.000.
Ushimaru, Akira; Fujiyama, Masaaki; Okutu, Toshimitu; and Miyoshi, Takahito, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,612,235, Cl. 428-216.000.
Uskokovic, Milan R.: *See*—
Baggiolini, Enrico G.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,612,308, Cl. 514-167.000.
V. Kann Rasmussen Industri A/S: *See*—
Lund, Arne; Nowakowski, Egon; Nielsen, Elgard; and Nielsen, Per G., 4,611,432, Cl. 49-192.000.
VACMETAL Gesellschaft fur Vakuum-Metallurgie mbH: *See*—
Kutscher, Horst; and Zahs, Gernot, 4,612,044, Cl. 75-49.000.
Vaerewyck, Eugene G.: *See*—
Chen, Cheng-lin; Asars, Juris A.; and Vaerewyck, Eugene G., 4,612,500, Cl. 324-96.000.
Valeo: *See*—
Despres, Dominique, 4,611,700, Cl. 192-98.000.
van Delden, Hildegard: *See*—
Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, 4,612,142, Cl. 252-555.000.

Van den Akker, Johannes A.: *See*—
Bouchette, Michael P.; Van den Akker, Johannes A.; and Watt, William R., 4,612,231, Cl. 428-167.000.
Vanderlaan, Robert D.; and Eiszner, William H., Jr., to Pneumo Corporation. Torque motor with high torque poles and magnetic centering spring adjustment. 4,612,526, Cl. 335-229.000.
Vanderpool, Clarence D.: *See*—
Kim, Tai K.; McClintic, Robert P.; and Vanderpool, Clarence D., 4,612,180, Cl. 423-593.000.
Scheithauer, Richard A.; Vanderpool, Clarence D.; and Miller, Michael J., 4,612,039, Cl. 75-0.5AA.
Van Gemert, Barry; Lavanish, Jerome M.; and Schwindeman, James A., to PPG Industries, Inc. Herbicidally active 3-oxadiazolyl-2-imidazolidinones. 4,612,038, Cl. 71-92.000.
Van Gijsel, Wilhelmus D. A. M.: *See*—
Nieuwendijk, Joris A. M.; and Van Gijsel, Wilhelmus D. A. M., 4,612,420, Cl. 179-115.5PV.
van Gorp, Keith N. Pivot assembly. 4,611,407, Cl. 33-471.000.
Van Iperen, Willem H. P.; and Cowhey, Thomas M., to Sea-Land Corporation. Wheel harness and a method for mounting a wheel harness on a wheel. 4,611,961, Cl. 410-20.000.
Van Steenwyk, Donald H., to Applied Technologies Associates. High speed well surveying. 4,611,405, Cl. 33-304.000.
Varotsos, Panayiotis A.; Alexopoulos, Kessar D.; and Nomicos, Konstantine D. Method of forecasting seismic activity responsive to earth currents. 4,612,506, Cl. 324-348.000.
Vasilchenko, Georgy A. Boring head. 4,611,958, Cl. 408-168.000.
Vassarotti, Enzo: *See*—
Gillio-tos, Mario; Vassarotti, Enzo; Schirmer, Henry G.; and von Bismarck, Gottfried, 4,611,456, Cl. 53-427.000.
Vasseghi, Nader; and Goddard, Donald G., to Advanced Micro Devices, Inc. Merged PMOS/bipolar logic circuits. 4,612,458, Cl. 307-446.000.
Vassileff, Neiko I. Foamed gypsum filter containing carbonaceous material. 4,612,333, Cl. 521-83.000.
Vaughan, James C.: *See*—
Skinnell, John A., 4,611,726, Cl. 220-408.000.
Venzke, Donald R.: *See*—
Sloan, Dallas; Venzke, Donald R.; and Wehr, Eugene, 4,612,430, Cl. 200-327.000.
Vepa Aktiengesellschaft: *See*—
Fleissner, Gerold, 4,611,476, Cl. 68-158.000.
Vereinigte Edelstahlwerke Aktiengesellschaft: *See*—
Holzl, Kurt, 4,611,672, Cl. 175-339.000.
Verheyden, Julien P. H.; and Martin, John C., to Syntex (U.S.A.) Inc. Substituted 9-(1 or 3-monoacyloxy or 1,3-diacyloxy-2-propoxymethyl) purines as antiviral agent. 4,612,314, Cl. 514-261.000.
Verlinden, Willy G.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,611,905, Cl. 355-14.00D.
Vesley, George F.; Zimmerman, Patrick G.; Chamberlain, Craig S.; and McAllister, Jerome W., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive tape containing coated glass microbubbles. 4,612,242, Cl. 428-313.900.
Vesperman, William: *See*—
Kiersarsky, Albert; Sauer, Earl S.; Vesperman, William; and Wilson, Max K., 4,612,233, Cl. 428-206.000.
Vetco Offshore Industries, Inc.: *See*—
Goris, Gregg A.; and Pettit, John, 4,611,663, Cl. 166-382.000.
Hed, Jon E.; and Draper, Robert B., 4,611,661, Cl. 166-339.000.
Hughes, David W., 4,611,829, Cl. 285-18.000.
Owens, Henry S., 4,611,953, Cl. 405-224.000.
Viaud, Jean: *See*—
Anstey, Henry D.; and Viaud, Jean, 4,611,535, Cl. 100-43.000.
Vickers, Incorporated: *See*—
Breeden, Robert H., 4,611,527, Cl. 91-420.000.
Gunda, Rajamouli, 4,612,489, Cl. 318-590.000.
Nanda, Vinod K.; and Taylor, Henry D., 4,611,528, Cl. 91-442.000.
Stricker, Peter A.; and Schweitzer, John J., 4,611,529, Cl. 91-499.000.
Victaulic Company of America: *See*—
Rung, Robert; and Ache, Lani G., 4,611,839, Cl. 285-367.000.
Victor Company of Japan, Ltd.: *See*—
Inami, Mamoru; and Tanaka, Yoshiaki, 4,612,665, Cl. 381-98.000.
Nakagaki, Shintaro; and Kuriyama, Takashi, 4,612,570, Cl. 358-36.000.
Victor, Mary H.: *See*—
Keedy, Edgar L., 4,611,466, Cl. 60-714.000.
Victor, Remi L.: *See*—
Keedy, Edgar L., 4,611,466, Cl. 60-714.000.
Vijayakumar, Kallambella M.: *See*—
Lichtin, Norman N.; and Vijayakumar, Kallambella M., 4,612,096, Cl. 204-157.460.
Villarruel, Carl A.: *See*—
Abebe, Moges; Burns, William K.; and Villarruel, Carl A., 4,612,028, Cl. 65-4.200.
Vilter Manufacturing Corporation: *See*—
Kocher, Erich J., 4,611,503, Cl. 74-603.000.
Vink, Nicolaas G.: *See*—
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,612,525, Cl. 335-213.000.
Virginia Chemicals Inc.: *See*—
Gupton, Frank; and Ulmer, Harry E., 4,612,389, Cl. 562-513.000.
Virnig, Michael J., to Henkel Corporation. Hydroformylation of olefinic compounds in the presence of a cobalt catalyst and an organic nitrile promoter. 4,612,403, Cl. 568-454.000.
Vittone, Andrea; Camprincoli, Pierpaolo; and Grandona, Adriano, to Montedison S.p.A.; and Moplefan S.p.A. Process for preparing fibrillated films or netlike structures of synthetic polymers. 4,612,229, Cl. 428-155.000.
Voest-Alpine Aktiengesellschaft: *See*—
Buchegger, Rudolf; and Hirschmanner, Franz, 4,611,988, Cl. 432-183.000.
Vogel, Raimund W. Skiboot. 4,611,414, Cl. 36-120.000.
Vogt, Russell G.: *See*—
Levin, Lev; Vogt, Russell G.; Eylon, Daniel; and Froes, Francis H., 4,612,066, Cl. 148-20.300.
Volker, David A.: *See*—
Wong, Vincent Y.; Volker, David A.; Jury, Lydia A.; and Bruno, David J., Jr., 4,612,203, Cl. 426-589.000.
Volksen, Willi: *See*—
Hofer, Donald C.; LaVergne, Debra B.; Twieg, Robert J.; and Volksen, Willi, 4,612,210, Cl. 427-82.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Buchholz, Peter; Schopke, Claus-Peter; and Warnecke, Rolf, 4,611,633, Cl. 138-26.000.
von Ahrens, Roger W. Partially consumable spacer chill rings and their use in welding pipe joints. 4,611,830, Cl. 285-22.000.
von Bismarck, Gottfried: *See*—
Gillio-tos, Mario; Vassarotti, Enzo; Schirmer, Henry G.; and von Bismarck, Gottfried, 4,611,456, Cl. 53-427.000.
von Seggern, Heinz: *See*—
Keith, Harvey D.; von Seggern, Heinz; Wang, Tsuey T.; and West, James E., 4,612,145, Cl. 264-22.000.
Vos, Cornelis; and Brasser, Jan, to Naarden International N.V. Process for utilizing tobacco dust. 4,611,608, Cl. 131-354.000.
Voss, Horst: *See*—
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.
Voss, Thomas C.; Lesperance, Delos P.; and Lindeman, Myron F., to Mosinee Paper Corporation. Modular paper towel dispenser. 4,611,768, Cl. 242-55.300.
Vuilleumier, Cyril; and Erni, Bruno, to Omega SA. Timepiece with calendar. 4,611,925, Cl. 368-28.000.
Vukovich, William J.: *See*—
Costello, Scott M.; and Vukovich, William J., 4,612,501, Cl. 324-208.000.
W. R. Grace & Co.: *See*—
Browne, Alan R., 4,612,276, Cl. 430-302.000.
W. R. Grace & Co., Cryovac Div.: *See*—
Compton, Stephen F.; and Thomas, Richard D., 4,611,728, Cl. 221-63.000.
Gillio-tos, Mario; Vassarotti, Enzo; Schirmer, Henry G.; and von Bismarck, Gottfried, 4,611,456, Cl. 53-427.000.
Mueller, Walter B.; and Schoenberg, Julian H., 4,612,245, Cl. 428-340.000.
Wada, Fumio; Ishijima, Koji; Sano, Fumiaki; and Asami, Kazutomo, to Mitsubishi Denki Kabushiki Kaisha. Refrigeration system with integral check valve. 4,611,473, Cl. 62-503.000.
Wada, Hideo: *See*—
Matsui, Kazuhiro; Wada, Hideo; Nakano, Yoshihito; and Hayashi, Toshihiro, 4,611,868, Cl. 339-59.00M.
Wada, Kanji, to Minolta Camera Kabushiki Kaisha. Control system for a copying machine. 4,611,904, Cl. 355-14.0SH.
Wada, Tetsuyoshi: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.
Wade, James J., to Riker Laboratories, Inc. Substituted 4-hydrazinopyrimides as intemediates for triazolo [4,3-c]pyrimidines. 4,612,375, Cl. 544-311.000.
Wagendristel, Alfred: *See*—
Krenn, Manfred; Raffer, Gerhard; Wagendristel, Alfred; and Bangert, Herwig, 4,611,487, Cl. 73-81.000.
Wagener, Heinz-Jurgen: *See*—
Lehmann, Gerhard; and Wagener, Heinz-Jurgen, 4,611,853, Cl. 297-379.000.
Wagner, Albrecht: *See*—
Stoll, Kurt; Heid, Georg; Schrag, Gerhard; and Wagner, Albrecht, 4,611,530, Cl. 92-13.500.
Wagner, Martin: *See*—
Sturm, Gerhard; Voss, Horst; Reinhardt, Wilhelm; Wagner, Martin; Best, Dieter; and Schumann, Reinhold, 4,612,468, Cl. 310-67.00R.
Wagner, Ronald H., to Memorex Corporation. Signal simulator for magnetic recording head. 4,612,517, Cl. 331-46.000.
Wagner Spray Tech Corporation: *See*—
Karliner, Rudolf R.; and Peterson, Gerald E., 4,611,941, Cl. 401-207.000.
Wakasugi, Kazuyuki: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.
Wake, Kanji: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko; Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.
Walko, John A.: *See*—
Nickeson, James L.; and Walko, John A., 4,611,545, Cl. 111-52.000.

Wallin, Glenn; Rosenwald, Diane; Citti, James; and Yong, Samuel, to Pillsbury Company, The. High stability, high flavor, breakfast pastry and method for preparing the same. 4,612,198, Cl. 426-94.000.

Wallin, Guy R. Process for the treatment of cellulose acetate fiber. 4,612,013, Cl. 8-196.000.

Wallroth, Carl-Friedrich: *See—*
Ryschka, Martin; Falb, Wolfgang; Buttner, Peter; and Wallroth, Carl-Friedrich, 4,611,590, Cl. 128-203.140.

Walsh, John J.; and Walsh, Michael W., to Dacomed Corporation. Artificial speech aid tone generating device. 4,612,664, Cl. 381-70.000.

Walsh, Michael W.: *See—*
Walsh, John J.; and Walsh, Michael W., 4,612,664, Cl. 381-70.000.

Walsh, Myles A.; and Morris, Robert S., to Cape Cod Research, Inc. Magnetic cellulose-derivative structures. 4,612,247, Cl. 428-402.000.

Wang, Hsien B., to Parker Hannifin Corporation. Hydraulic circuit breaker. 4,611,620, Cl. 137-100.000.

Wang, Nui, to Girlock Limited. Caliper disc brake. 4,611,693, Cl. 188-73.340.

Wang, Tsuey T.: *See—*
Keith, Harvey D.; von Seggern, Heinz; Wang, Tsuey T.; and West, James E., 4,612,145, Cl. 264-22.000.

Ward, Robert L.: *See—*
Morgan, Ricky D.; Sylvester, Vito P.; and Ward, Robert L., 4,612,162, Cl. 419-28.000.

Warnecke, Rolf: *See—*
Buchholz, Peter; Schopke, Claus-Peter; and Warnecke, Rolf, 4,611,633, Cl. 138-26.000.

Warner, Hermann, to General Motors Corporation. Window pane adjustable in height, particularly for motor vehicles. 4,611,435, Cl. 49-374.000.

Warner-Lambert Company: *See—*
Barth, Hubert; Hartenstein, Johannes; Satzinger, Gerhard; Fritschi, Edgar; Osswald, Hartmut; and Bartoszyk, Gerd, 4,612,311, Cl. 514-222.000.
Knecht, Adolf, 4,612,310, Cl. 514-222.000.

Warren, Sean T.: *See—*
Eidsvoog, Frank H.; and Warren, Sean T., 4,611,627, Cl. 137-588.000.

Warwicker, Clive W., to Helix Limited. Cash box. 4,611,711, Cl. 206-0.810.

Waryu, Joseph C.: *See—*
Turner, James J.; and Waryu, Joseph C., 4,611,762, Cl. 239-708.000.

Washington, Derek, to U.S. Philips Corporation. Penetron color display tube with channel plate electron multiplier. 4,612,483, Cl. 315-376.000.

Wasserman, Gerald S., to Purdue Research Foundation. Sensory prostheses. 4,611,596, Cl. 128-419.00R.

Wasserman, Jacob. Saccadic enhancer apparatus. 4,611,583, Cl. 128-76.500.

Wassmer, Paul; and Schake, Fritz, to Kupfermuhle Holztechnik GmbH. Workpiece-centering two-sided planer. 4,611,646, Cl. 144-117.00R.

Watanabe, Rikizo; and Sakamoto, Daizi, to Hitachi Metals, Ltd. Copper-base alloys for leadframes. 4,612,167, Cl. 420-471.000.

Watari, Toshihiko, to NEC Corporation. Heat dissipative integrated circuit chip package. 4,612,601, Cl. 361-387.000.

Watkins, Ivan W. Solar powered focusing and directing apparatus for cutting, shaping, and polishing. 4,611,857, Cl. 299-14.000.

Watkins, Robert L.; and Peters, Kenneth R., to JBF Scientific Company, Inc. Fluid-storage tank. 4,611,724, Cl. 220-5.00A.

Watsco, Inc.: *See—*
Snyder, Benjamin L., 4,611,624, Cl. 137-318.000.

Watson, Norman F.: *See—*
Brown, Kenneth R.; and Watson, Norman F., 4,611,491, Cl. 73-517.00B.

Watt, William R.: *See—*
Bouchette, Michael P.; Van den Akker, Johannes A.; and Watt, William R., 4,612,231, Cl. 428-167.000.

Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., to D. L. Auld Company, The. Substrateless trim strip and method of making. 4,612,075, Cl. 156-242.000.

Wavetek Rockland Scientific, Inc.: *See—*
Bertrand, John, 4,612,625, Cl. 361-724.000.

Weal, Bryan J.: *See—*
Fairwood, Raymond S.; and Weal, Bryan J., 4,612,264, Cl. 429-114.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Panick, Karl, 4,611,985, Cl. 431-240.000.

Weber, James L.: *See—*
Hickson, Russell L.; and Weber, James L., 4,611,694, Cl. 188-73.450.

Weber, Ronald G., to Lowrance Electronics, Inc. Sonar apparatus with means to transmit and print on alternate cycles. 4,612,633, Cl. 367-115.000.

Wedler, Klaus, to Croon & Lucke Maschinenfabrik GmbH & Co. KG. Device for transferring a ball from a winding mandrel to a carrier member arranged on a conveyor belt. 4,611,707, Cl. 198-468.200.

Wegener, Ingo: *See—*
Piorr, Robert; van Delden, Hildegard; Luttge, Sabine; Bahr, Bernd; and Wegener, Ingo, 4,612,142, Cl. 252-555.000.

Wehr, Eugene: *See—*
Sloan, Dallas; Venzke, Donald R.; and Wehr, Eugene, 4,612,430, Cl. 200-327.000.

Weicht, Charles E.: *See—*
Schnelle, Steven H.; Wood, Richard D.; and Weicht, Charles E., 4,611,374, Cl. 29-157.10R.

Weimer, Paul K., to RCA Corporation. TDM-input electrometer, as in a line transfer CCD imager, using a charge funnel. 4,612,580, Cl. 358-213.000.

Weiner, Maurice; Carter, John L.; and Youmans, Robert J., to United States of America, Army. Distributed pulse forming network for magnetic modulator. 4,612,455, Cl. 307-419.000.

Weingart, Mark H. Apparatus for clearing the line of a marine speedometer with pressurized gas. 4,611,488, Cl. 73-182.000.

Weinmann GmbH & Co., KG: *See—*
Schoch, Robert, 4,611,690, Cl. 188-24.110.

Wells, William M., III: *See—*
Gillard, Calvin W.; Buholz, Neal E.; and Wells, William M., III, 4,611,915, Cl. 356-349.000.

Wenzel, George, to Sanitary Products Corp. All-purpose sanitary cleaning composition. 4,612,135, Cl. 252-106.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Bosshard, Werner; and Schroder, Willi, 4,611,525, Cl. 89-193.000.
Kotthaus, Erich, 4,611,956, Cl. 409-26.000.

Werner, Heinz; Kluting, Bernd A.; Bertram, Klaus D.; and Svoboda, Frantisek, to Keiper Recaro GmbH & Co. Adjusting device for vehicle seats. 4,611,778, Cl. 248-429.000.

Werner, Ilona: *See—*
Birr, Christian; Stollenwerk, Ulrich, deceased; Stollenwerk, Paul, heir; Stollenwerk, Margot, heir; and Werner, Ilona, 4,612,365, Cl. 530-301.000.

West, James E.: *See—*
Keith, Harvey D.; von Seggern, Heinz; Wang, Tsuey T.; and West, James E., 4,612,145, Cl. 264-22.000.

Westdale, Virgil W.; and Hanrahan, James L., to AM International. Method of fabricating a lithographic master. 4,612,269, Cl. 430-49.000.

Westdale, Virgil W., to AM International, Inc. Pressure fixing a single component toner with polyamide-rosin. 4,612,272, Cl. 430-98.000.

Westdale, Virgil W.; and Hanrahan, James L., to AM International, Inc. Pressure fixing a single component toner with polyamide-rosin. 4,612,273, Cl. 430-98.000.

Western Gear Corporation: *See—*
Larson, Wallace H., 4,611,944, Cl. 403-60.000.

Westfalische Metall Industrie KG Hueck & Co.: *See—*
Peitz, Wolfgang, 4,612,608, Cl. 362-297.000.

Westinghouse Electric Corp.: *See—*
Boire, Daniel C.; Degenford, James E.; and Cohn, Marvin, 4,612,520, Cl. 333-156.000.
Chen, Cheng-lin; Asars, Juris A.; and Vaerewyck, Eugene G., 4,612,500, Cl. 324-96.000.
De Long, Ronald B., 4,611,448, Cl. 52-239.000.
Goldberg, Newton N.; and Merian, Jacques S., 4,612,246, Cl. 428-379.000.
Jackovitz, John F.; and Peterson, Steven H., 4,612,097, Cl. 204-157.200.
Maier, Alfred E.; Farley, James R.; and Tomasic, Nicholas A., 4,612,426, Cl. 200-144.00R.
Milianowicz, Stanislaw A., 4,612,429, Cl. 200-288.000.
Reichenecker, William J., 4,612,208, Cl. 427-53.100.

Westphal, Glenn H.; and Sherer, Jimmie B., to Texas Instruments Incorporated. Arsenic cell stabilization valve for gallium arsenide in-situ compounding. 4,612,082, Cl. 156-607.000.

Westvaco Corporation: *See—*
Miller, James E., Jr.; and Dilling, Peter, 4,612,051, Cl. 106-30.000.

Westwood, James S.; and Maydew, Peter H., to Sinclair Research Limited. Television receivers. 4,612,484, Cl. 315-384.000.

Wetzel, Rodney J.: *See—*
Salerni, John V.; and Wetzel, Rodney J., 4,611,658, Cl. 166-134.000.

Weyer, Erhard; and Zuchner, Werner, to Mentor Ing. Dr. Paul Mozar. Front plate mounting group for a printed circuit board. 4,612,602, Cl. 361-394.000.

Wheeler, Douglas J.: *See—*
Dewing, Ernest W.; Gesing, Adam J.; Hudson, Thomas J.; Manfredo, Louis J.; Wheeler, Douglas J.; Bennett, William R.; and Clere, Thomas M., 4,612,103, Cl. 204-243.00R.

Wheelock, John T.: *See—*
Schmidt, Frederick A.; Peterson, David T.; and Wheelock, John T., 4,612,047, Cl. 420-83.000.

Whisnant, Daniel H. Creel apparatus for electrical wire. 4,611,645, Cl. 242-129.500.

White, John F.: *See—*
Shum, Wilfred P.; and White, John F., 4,612,390, Cl. 562-522.000.

White, Thomas C. Corneal implant. 4,612,012, Cl. 623-5.000.

Whitney, Wayne T.; and Hara, Hiroshi, to United States of America, Navy. Operation of transversely excited N_2O lasers. 4,612,642, Cl. 372-33.000.

Wickens, Thomas A. Geodesic dome. 4,611,441, Cl. 52-81.000.

Wiegand, Martin. Support stand in particular for holding trees to be put up. 4,611,781, Cl. 248-526.000.

Wier, Franz, to TRW Repa GmbH. Belt lock for a safety belt. 4,611,369, Cl. 24-642.000.

Wieting, Robert D.; and Potter, Richard R., to Atlantic Richfield Company. Thin film solar cell with ZnO window layer. 4,612,411, Cl. 136-265.000.

Wiggins Teape Group Limited, The: *See—*
Pinot de Moira, Peter, 4,612,556, Cl. 346-215.000.

Wikstrom, Hakan V.: *See—*
Andersson, Bengt R.; Arvidsson, Folke L.; Carlsson, Per A. E.; Hjort, John S. M.; Johansson, Anette M.; Lindberg, Per L.; Nilsson, John L. G.; Sanchez, Domingo; Svensson, Kjell A. I.; and Wikstrom, Hakan V., 4,612,316, Cl. 514-290.000.

Wilda, Douglas W.: *See*—
Lam, Ken; Pond, John H.; and Wilda, Douglas W., 4,612,227, Cl. 428-137.000.
Wilhelm Hedrich Vacuumanlagen GmbH & Co. KG: *See*—
Haeuser, Erhard; and Hedrich, Wilhelm, 4,611,982, Cl. 425-543.000.
Wilkinson, Robert E.: *See*—
Iseler, Kenneth A.; and Wilkinson, Robert E., 4,612,149, Cl. 264-101.000.
Willett International Limited: *See*—
Moss, James A., 4,612,076, Cl. 156-249.000.
Willetts, Charles A., to Allied Tube & Conduit Corporation. Metallic wall having knockouts and method of forming. 4,611,480, Cl. 72-326.000.
William H. Rorer, Inc.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Neuenschwander, Kent W., 4,612,309, Cl. 514-212.000.
Williams, Conrad F.: *See*—
Laplace, Carl J., Jr.; and Williams, Conrad F., 4,612,617, Cl. 364-483.000.
Williams, Harold L., to Southern Door Company. Sliding door assembly. 4,611,436, Cl. 49-425.000.
Williams, Stanley B. Device for aligning a weldolet and a pipe to be joined. 4,611,743, Cl. 228-49.100.
Williams, William J. Roller clamp for engine test stand. 4,611,776, Cl. 248-228.000.
Willis, Donald W. Rodent bait station. 4,611,426, Cl. 43-131.000.
Wilson, Max K.: *See*—
Kiersarsky, Albert; Sauer, Earl S.; Vesperman, William; and Wilson, Max K., 4,612,233, Cl. 428-206.000.
Wilson, Michael D.; and Schmitt, Dale A., to Metalines, Inc. Exterior expansion joint cover assembly. 4,611,449, Cl. 52-278.000.
Wilson, William C., to Eastman Kodak Company. Booklet finishing apparatus. 4,611,741, Cl. 227-99.000.
Windle, Patrick J.: *See*—
Jorgensen, Ralph H.; and Windle, Patrick J., 4,611,443, Cl. 52-95.000.
Wingender, Ronald J.: *See*—
Harkness, John B. L.; Doctor, Richard D.; and Wingender, Ronald J., 4,612,175, Cl. 423-235.000.
Winter, Friedrich: *See*—
Heilmann, Wolfgang; Lenze, Friedrich; Missaire, Gerhard; and Winter, Friedrich, 4,611,838, Cl. 285-331.000.
Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Process and apparatus for fabricating optical fiber cables. 4,611,748, Cl. 228-170.000.
Winters, Giorgio, to Gruppo Lepetit S.p.A. CNS-depressant and analgesic tricyclo-[pyrazolo-[3,4-6]-pyridine] derivatives and pharmaceutical compositions thereof. 4,612,318, Cl. 514-293.000.
Wisconsin Alumni Research Foundation: *See*—
Duff, Thomas A., 4,611,582, Cl. 128-69.000.
Wisniewski, Jacob H., to Ford Aerospace & Communications Corporation. Digital limiter. 4,612,507, Cl. 328-169.000.
Wittenbecher, Hasso: *See*—
Matthes, Hans G.; and Wittenbecher, Hasso, 4,612,611, Cl. 363-49.000.
Witty, Robert W.: *See*—
Ackert, Robert J.; Witty, Robert W.; and Crozier, Peter A., 4,611,789, Cl. 266-81.000.
Woffinden, Gary A.; Hanson, Donald L.; and Amdahl, Gene M., to Amdahl Corporation. Virtually addressed cache. 4,612,612, Cl. 364-200.000.
Wohlford, William P.; and Orlandea, Nicolae V., to Deere & Company. Track section having cooperating flexor, link and grouser design for reducing stress. 4,611,860, Cl. 305-43.000.
Wolf, Patrick: *See*—
Piteau, Marc; Senet, Jean-Pierre; Wolf, Patrick; Olofson, Roy A.; and Dang, Vu A., 4,612,143, Cl. 558-282.000.
Wolfram, Peter: *See*—
Fabian, Werner; Roehle, Helmut; and Wolfram, Peter, 4,612,174, Cl. 423-210.000.
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., to Chevron Research Company. Modified succinimides. 4,612,132, Cl. 252-51.50A.
Wologodzew, Leo: *See*—
Gavronsky, German; and Wologodzew, Leo, 4,611,736, Cl. 226-134.000.
Wolter, Bernd; and Pott, Paul G., to AEG Elotherm GmbH. Apparatus for the electrochemical etching of grooves of very small width. 4,612,101, Cl. 204-224.00M.
Wolter, Eric H.: *See*—
Moller, Craig A.; and Wolter, Eric H., 4,612,651, Cl. 373-130.000.
Wong, Chun S.; and Zelonka, Ronald A., to Du Pont Canada Inc. Process for the grafting of monomers onto polyolefins. 4,612,155, Cl. 264-176.00R.
Wong, Patrick S. L.; Barclay, Brian; Deters, Joseph C.; and Theeuwes, Felix, to Alza Corporation. Osmotic device with dual thermodynamic activity. 4,612,008, Cl. 604-892.000.
Wong, Vincent Y.; Volker, David A.; Jury, Lydia A.; and Bruno, David J., Jr., to Procter & Gamble Company, The. Acidified meat analog products. 4,612,203, Cl. 426-589.000.
Wood, Richard D.: *See*—
Schnelle, Steven H.; Wood, Richard D.; and Weicht, Charles E., 4,611,374, Cl. 29-157.10R.
Woodlief, Fredrick E.: *See*—
Clark, Michael R.; Tringali, Dominick; Woodlief, Fredrick E.; and Orosz, Miklos J., 4,612,424, Cl. 200-50.00A.
Worley, Robert F., to Donn Incorporated. Suspension ceiling grid connectors. 4,611,453, Cl. 52-667.000.
Wormald International Limited: *See*—
Byrne, Barry F., 4,611,665, Cl. 169-37.000.
Worner, Jorg: *See*—
Hewig, Gert; Huschka, Hans; Schurich, Bernd; and Worner, Jorg, 4,612,410, Cl. 136-256.000.
Wovkulich, Peter M.: *See*—
Baggiolini, Enrico G.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,612,308, Cl. 514-167.000.
Wu, Kent K., to Henry Ford Hospital. Intervertebral body stabilization. 4,611,580, Cl. 128-69.000.
Wuerzer, Bruno: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; and Wuerzer, Bruno, 4,612,036, Cl. 71-91.000.
Xerox Corporation: *See*—
Folkins, Jeffrey J., 4,611,900, Cl. 355-3.0DD.
Jansen, Frank, 4,612,207, Cl. 427-39.000.
Poleshuk, Michael, 4,612,554, Cl. 346-140.00R.
Yacavone, Michael J.: *See*—
Holbrook, Kyle A.; and Yacavone, Michael J., 4,612,663, Cl. 381-24.000.
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for preparing water-soluble acrylic polymers by irradiating aqueous monomer solutions containing a surfactant. 4,612,336, Cl. 522-3.000.
Yagi, Kenkichi: *See*—
Kato, Hiroyasu; and Yagi, Kenkichi, 4,612,228, Cl. 428-151.000.
Yakigaya, Nobuyuki: *See*—
Hayashi, Kiyotaka; Ohzono, Kohei; and Yakigaya, Nobuyuki, 4,612,002, Cl. 474-28.000.
Yakuwa, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Backup system for electronic fuel injection control system. 4,611,565, Cl. 123-479.000.
Yale University: *See*—
Dothan, Felix, 4,612,477, Cl. 315-111.210.
Yamada, Shinichi: *See*—
Ito, Katsuya; and Yamada, Shinichi, 4,611,872, Cl. 339-94.00M.
Yamada, Shinji: *See*—
Kimura, Shin; Fukui, Hiroshi; Yamada, Shinji; Musha, Shuji; and Sato, Masayoshi, 4,612,561, Cl. 357-38.000.
Yamada, Yuichiro: *See*—
Tanno, Masuo; and Yamada, Yuichiro, 4,612,099, Cl. 204-92.320.
Yamaguchi, Akihiro: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; and Yamaguchi, Akihiro, 4,612,388, Cl. 562-443.000.
Yamaguchi, Masahiko: *See*—
Anzai, Mitsutoshi; Yamaguchi, Masahiko; Wakasugi, Kazuyuki; Suzuka, Susumu; Gonda, Michihiro; Abe, Toshiyuki; Kikkawa, Katsumasa; and Kanasugi, Mikiko, 4,612,558, Cl. 346-221.000.
Yamaguchi, Yuzo: *See*—
Sato, Toshiya; Asano, Kenichi; and Yamaguchi, Yuzo, 4,612,190, Cl. 424-49.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Suyama, Koji, 4,611,561, Cl. 123-360.000.
Yamamoto Kogyo Kabushiki Kaisha: *See*—
Tsuji, Shuya; Kawabata, Yoshichika; and Yamamoto, Rokuro, 4,611,980, Cl. 425-435.000.
Yamamoto, Masaki; and Takada, Shigeyuki, to Takeda Chemical Industries. Method for producing formed product of high molecular compounds. 4,612,364, Cl. 528-491.000.
Yamamoto, Nobuyuki; and Nakai, Tatsuaki, to Kyoto Measuring Instruments Corp. Digital tape measure. 4,611,402, Cl. 33-139.000.
Yamamoto, Rokuro: *See*—
Tsuji, Shuya; Kawabata, Yoshichika; and Yamamoto, Rokuro, 4,611,980, Cl. 425-435.000.
Yamanaka, Masami, to Yamato Scale Company, Limited. Mass meter. 4,611,675, Cl. 177-1.000.
Yamashita, Akira: *See*—
Shimizu, Wataru; and Yamashita, Akira, 4,612,503, Cl. 324-208.000.
Yamato Scale Company, Limited: *See*—
Adachi, Motoyuki; and Kohashi, Toru, 4,611,674, Cl. 177-1.000.
Yamanaka, Masami, 4,611,675, Cl. 177-1.000.
Yamauchi, Junichi: *See*—
Omura, Ikuo; Yamauchi, Junichi; Nagase, Yoshinori; and Uemura, Fumiko, 4,612,384, Cl. 558-198.000.
Yamauchi, Takao; Suzuki, Hayato; Iwabuchi, Osamu; and Kishimoto, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Generator circuitry. 4,612,495, Cl. 322-100.000.
Yamaura, Mitsuru; and Shuto, Ituo, to Kabushiki Kaisha Toshiba. Protective relay system and sampling synchronizing method therefor. 4,612,594, Cl. 361-68.000.
Yamazaki, Tatsuo: *See*—
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.
Yamazaki, Yuetsu, to Nippon Electric Co., Ltd. Integrated circuit device having a circuit means for detecting a disconnection of input signal line. 4,612,453, Cl. 307-303.000.
Yanagi, Kenichi: *See*—
Shimozato, Yoshio; Wada, Tetsuyoshi; Yanagi, Kenichi; Kato, Mitsuo; Furukawa, Heizaburo; Wake, Kanji; Morita, Arihiko;

Tsukiji, Norio; Aiko, Takuya; Kittaka, Toshiharu; and Nakanishi, Yasuji, 4,612,206, Cl. 427-9.000.

Yanagishita, Masami; and Ogita, Yasunori, to Honda Giken Kogyo Kabushiki Kaisha. Air intake device for motor vehicles with riding saddles. 4,611,679, Cl. 180-68.300.

Yano, Toshihiko: *See—*
Kisida, Hirosi; and Yano, Toshihiko, 4,612,323, Cl. 514-394.000.

Yasuda, Tomino; and Hashimoto, Akio, to Aisin Seiki Kabushiki Kaisha. Motor-driven power steering system. 4,611,682, Cl. 180-79.100.

Yasui, Tsuneo, to Brother Kogyo Kabushiki Kaisha. Thermal printer. 4,611,936, Cl. 400-120.000.

Yasumoto, Masaaki; Hayama, Hiroshi; and Enomoto, Tadayoshi, to NEC Corporation. Process of fabricating three-dimensional semiconductor device. 4,612,083, Cl. 156-633.000.

Yasunaga, Hirokazu: *See—*
Kumagai, Atsushi; Tanabe, Tsutomu; and Yasunaga, Hirokazu, 4,612,260, Cl. 428-667.000.

Yates, Stephen W.: *See—*
Smith, Alan; and Yates, Stephen W., 4,611,463, Cl. 57-263.000.

Yazaki, Kazuhiko: *See—*
Abe, Kazuyoshi; Kawasaki, Masahiko; Yazaki, Kazuhiko; and Sekine, Yoshitada, 4,611,380, Cl. 29-430.000.

Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Method of bilirubin detection. 4,612,290, Cl. 436-97.000.

Yeh, Kuo-Chen; and Synodis, Joseph, to Block Drug Co., Inc. Stain removal toothpaste. 4,612,191, Cl. 424-52.000.

Yokomizo, Hiroshi: *See—*
Miura, Kiyoshi; Yokomizo, Hiroshi; Sasaya, Osamu; Morishita, Hajime; and Tomita, Yoshifumi, 4,612,268, Cl. 430-28.000.

Yokota, Takashi, to Ricoh Company, Ltd. Receptacle for memory cassette. 4,611,864, Cl. 312-12.000.

Yokoyama, Shotaro: *See—*
Suzuki, Kiziro; Tsutsumi, Takashi; Yokoyama, Shotaro; and Nishibe, Takashi, 4,611,910, Cl. 356-1.000.

Yong, Samuel: *See—*
Wallin, Glenn; Rosenwald, Diane; Citti, James; and Yong, Samuel, 4,612,198, Cl. 426-94.000.

Yoshida, Hiroshi: *See—*
Kobayashi, Yoshiaki; and Yoshida, Hiroshi, 4,611,686, Cl. 181-156.000.

Yoshida Kogyo K. K.: *See—*
Ikemura, Akio; and Kajiki, Minoru, 4,611,653, Cl. 165-54.000.
Miyakawa, Kazuo, 4,611,546, Cl. 112-121.270.

Yoshida, Masayuki; and Suzuki, Shota, to Mitsubishi Denki Kabushiki Kaisha. Velocity control apparatus for elevator. 4,611,689, Cl. 187-29.00R.

Yoshida, Okio: *See—*
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,612,581, Cl. 358-213.000.

Yoshida, Toshihiko: *See—*
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Kurata, Sakae; Nishino, Hiroyuki; and Yoshida, Toshihiko, 4,612,329, Cl. 514-523.000.

Yoshimoto, Akihiro; Fujii, Shizuka; Kubo, Katsuro; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, to Sanraku Incorporated. Anthracycline antibiotics. 4,612,371, Cl. 536-6.400.

Yoshimura, Toshio: *See—*
Tanaka, Shinsaku; and Yoshimura, Toshio, 4,612,591, Cl. 360-93.000.

Yoshino, Hisashi: *See—*
Nakahashi, Masako; Shirokane, Makoto; Yamazaki, Tatsuo; Yoshino, Hisashi; Hori, Akio; and Takeda, Hiromitsu, 4,611,745, Cl. 228-123.000.

Yoshioka, Takeo; Maeda, Miharu; Okamoto, Rokuro; Shimauchi, Yasutaka; Ishikura, Tomoyuki; Sawa, Tsutomu; Takeuchi, Tomio; and Umezawa, Hamao, to Sanraku Incorporated. Tylosin derivatives. 4,612,372, Cl. 536-7.100.

Yoshizaki, Kouji; and Tanahashi, Toshio, to Toyota Jidosha Kabushiki Kaisha. Valve actuating apparatus in internal combustion engine. 4,611,558, Cl. 123-90.160.

Yoshizumi, Keiichi, to Matsushita Electric Industrial Co., Ltd. Optical measuring apparatus. 4,611,916, Cl. 356-349.000.

Youmans, Robert J.: *See—*
Weiner, Maurice; Carter, John L.; and Youmans, Robert J., 4,612,455, Cl. 307-419.000.

Young, Richard H.; and McLaughlin, Edward T. Open access stud gripping tool. 4,611,513, Cl. 81-53.200.

Yu, George T., to National Controls, Inc. Shock proof scale. 4,611,677, Cl. 177-187.000.

Zahs, Gernot: *See—*
Kutscher, Horst; and Zahs, Gernot, 4,612,044, Cl. 75-49.000.

Zaman, Mohammad F.: *See—*
Peppler, Dennis L.; Zaman, Mohammad F.; Bornstein, Norman S.; and Hartz, Marvin E., 4,611,747, Cl. 228-125.000.

Zansky, Zoltan, to Honeywell Inc. Fluorescent light controller. 4,612,479, Cl. 315-194.000.

Zapawa, John J., to Progressive Tool & Industries Co. Apparatus for assembling radiator cores. 4,611,375, Cl. 29-157.30C.

Zazzu, Victor: *See—*
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,612,531, Cl. 340-347.0AD.

Zdeb, Brian D.: *See—*
Beebe, Susan M.; Dennehey, T. Michael; Kruger, Robert J.; and Zdeb, Brian D., 4,611,643, Cl. 141-311.00R.

Zdunek, Kenneth J.; and Hess, Garry C., to Motorola, Inc. Dynamic control of telephone traffic in a trunked radio system. 4,612,415, Cl. 179-2.0EB.

Zeder, Werner: *See—*
Spath, Gunther; and Zeder, Werner, 4,612,421, Cl. 179-175.000.

Zelkowitz, Phillip, to Albany-Chicago Corporation. Method of making multiple magnet core units. 4,611,649, Cl. 164-108.000.

Zelonka, Ronald A.: *See—*
Wong, Chun S.; and Zelonka, Ronald A., 4,612,155, Cl. 264-176.00R.

Zenith Electronics Corporation: *See—*
Moon, Frederick H., 4,612,571, Cl. 358-86.000.
Olson, Anthony M., 4,612,632, Cl. 365-226.000.

Zerr, Bruce A., to United States of America, Energy. Laser utilizing a gaseous lasing medium and method for operating the same. 4,612,646, Cl. 372-58.000.

Zeybekoglu, Annie: *See—*
Als, Heidelise; and Zeybekoglu, Annie, 4,611,353, Cl. 2-69.000.

Ziegler, Karlheinz. Capacitive pressure sensor. 4,612,599, Cl. 361-283.000.

Ziegler S.A.: *See—*
Hennechart, Jean-Paul; Bramaud, Bernard; and Prat, Francois, 4,612,215, Cl. 427-19.00R.

Zijlstra, Hinne, to U.S. Philips Corporation. Nuclear magnetic resonance apparatus. 4,612,505, Cl. 324-318.000.

Zilog, Inc.: *See—*
Tsang, Juine-Kai, 4,612,258, Cl. 428-620.000.

Zimmerman, Joseph, to Du Pont de Nemours, E. I., and Company. Spinning of certain high molecular weight anisotropic melt forming polyesters. 4,612,154, Cl. 264-176.200.

Zimmerman, Patrick G.: *See—*
Vesley, George F.; Zimmerman, Patrick G.; Chamberlain, Craig S.; and McAllister, Jerome W., 4,612,242, Cl. 428-313.900.

Zimmerman, William B.: *See—*
Bennett, Terry A.; Zimmerman, William B.; and Maslanka, Michael B., 4,612,031, Cl. 65-106.000.

Zinner GmbH: *See—*
Hochmuth, Walter; and Hollfelder, Hans-Peter, 4,611,516, Cl. 82-1.200.

Zinsmeyer, Thomas M., to Carrier Corporation. Calibrating apparatus and method for a movable diffuser wall in a centrifugal compressor. 4,611,969, Cl. 415-1.000.

Zirk, Elisabeth: *See—*
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,611,932, Cl. 384-481.000.

Zorayan, Vahan; and Fiquet, Claire, to L'Oreal. Cosmetic compositions which contain bis-(quaternary ammonium) derivatives with two lipophilic chains and certain said derivatives. 4,612,188, Cl. 424-47.000.

Zuchner, Werner: *See—*
Weyer, Erhard; and Zuchner, Werner, 4,612,602, Cl. 361-394.000.

501 Hollingsworth (UK) Limited: *See—*
Pinner, Vernon G.; and Richardson, John, 4,611,462, Cl. 57-263.000.

501 Juridical Foundation, The Chemo-Sero-Therapeutic Research Institute: *See—*
Sugahara, Keishin; Nozaki, Chikateru; Hamada, Fukusaburo; Miake, Fumio; and Ohtomo, Nobuya, 4,612,283, Cl. 435-68.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blecher, Peter, to TWB-Pressteile GmbH. Grate for drainage ducts. Re. 32,248, Cl. 210-163.000.

Hazen Research, Inc.: *See*—
Stephens, Frank M., Jr., Re. 32,247, Cl. 75-11.000.

Stephens, Frank M., Jr., to Hazen Research, Inc. Process for the direct production of steel. Re. 32,247, Cl. 75-11.000.

TWB-Pressteile GmbH: *See*—
Blecher, Peter, Re. 32,248, Cl. 210-163.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Albertson, Orris E.: *See*—
Fitch, Elliot B.; and Albertson, Orris E., B1 4,159,682, Cl. 110-245.000.

Bayer Aktiengesellschaft: *See*—
Juffa, Richard; and Boden, Heinrich, B1 4,275,822, Cl. 222-63.000.

Boden, Heinrich: *See*—
Juffa, Richard; and Boden, Heinrich, B1 4,275,822, Cl. 222-63.000.

De La Cruz, Richard: *See*—
Parente, Richard E.; and De La Cruz, Richard, B1 4,470,600, Cl. 273-80.00B.

Dobler, Klaus: *See*—
Hachtel, Hansjorg; and Dobler, Klaus, B1 4,356,732, Cl. 73-862.330.

Dorr-Oliver Incorporated: *See*—
Fitch, Elliot B.; and Albertson, Orris E., B1 4,159,682, Cl. 110-245.000.

Fitch, Elliot B.; and Albertson, Orris E., to Dorr-Oliver Incorporated. Fluid bed combustion with predrying of moist feed using bed sand. B1 4,159,682, 9-16-86, Cl. 110-245.000.

Hachtel, Hansjorg; and Dobler, Klaus, to Robert Bosch GmbH. Torque and torsion angle measuring apparatus. B1 4,356,732, 9-16-86, Cl. 73-862.330.

Hickory Stick USA: *See*—
Parente, Richard E.; and De La Cruz, Richard, B1 4,470,600, Cl. 273-80.00B.

Inoue, Kiyoshi. Solid-state pulse generator for electric-discharge machining. B1 3,360,683, 9-16-86, Cl. 315-209.00R.

Juffa, Richard; and Boden, Heinrich, to Bayer Aktiengesellschaft. Apparatus for metering at least two reaction components into a mixing chamber. B1 4,275,822, 9-16-86, Cl. 222-63.000.

Parente, Richard E.; and De La Cruz, Richard, to Hickory Stick USA. Golf club. B1 4,470,600, 9-16-86, Cl. 273-80.00B.

Robert Bosch GmbH: *See*—
Hachtel, Hansjorg; and Dobler, Klaus, B1 4,356,732, Cl. 73-862.330.

Spina, Joseph; and Weibel, Michael K. Intralenticular cataract surgery. B1 4,078,564, 9-16-86, Cl. 604-51.000.

Weibel, Michael K.: *See*—
Spina, Joseph; and Weibel, Michael K., B1 4,078,564, Cl. 604-51.000.

LIST OF DESIGN PATENTEES

Actifit, Inc.: *See*—
Grundler, Helmut; and Grundler, Gottfried, 285,724, Cl. D24-36.000.

Adams, Peter D.; and Hartshorne, John M., to Quadrastat Corporation. Valve actuator control unit. 285,717, 9-16-86, Cl. D23-19.000.

Advanced Evauation Systems, Inc.: *See*—
Forrest, William E., 285,623, Cl. D2-27.000.

Advanced Plastics, Inc.: *See*—
Waters, John E., 285,673, Cl. D12-157.000.

AFA Corporation, The: *See*—
Garneau, Richard P., 285,713, Cl. D23-17.000.

Airwick Industries, Inc.: *See*—
Paulovich, John M.; and Patel, Manharbhai K., 285,659, Cl. D9-413.000.

Akita, Tsugio; Kawata, Yoshiaki; and Uematsu, Toyoyuki, to Matsushita Electric Industrial Co., Ltd. Projection television receiver. 285,684, 9-16-86, Cl. D14-80.000.

Albiez, Robert C. Portable battery powered refrigerator/freezer. 285,692, 9-16-86, Cl. D15-81.000.

Alpine Electronics, Inc.: *See*—
Tanaka, Fumio; and Yamaguchi, Akio, 285,667, Cl. D10-106.000.
Tanaka, Fumio; and Yamaguchi, Akio, 285,668, Cl. D10-106.000.

AMC International ALFA Metalcraft Corporation: *See*—
Schultz, Horst, 285,642, Cl. D7-137.000.

Amigo Sales, Inc.: *See*—
Thieme, Allan R.; Dominguez, Henry L.; Piziks, Indulis; and Elson, Ronald D., 285,671, Cl. D12-131.000.

Anchor Hocking Corporation: *See*—
Gobleck, Peter A., Jr., 285,636, Cl. D7-6.000.

Applegate, Robert L., Jr., to Under Sea Industries, Inc. Scuba instrument case. 285,664, 9-16-86, Cl. D10-102.000.

Arjo Instrument AB: *See*—
Johansson, Hans A. V., 285,718, Cl. D23-56.000.

Arrow Plastic Manufacturing Co.: *See*—
Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, 285,639, Cl. D7-99.000.

Avdel Limited: *See*—
Lacey, Raymond D., 285,650, Cl. D8-386.000.

Axhamre, Frans L. Video stand. 285,632, 9-16-86, Cl. D6-474.000.

Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 285,693, Cl. D15-125.000.

Ballard, Dale H., to Ballard Medical Products. Surgical scrub brush. 285,627, 9-16-86, Cl. D4-120.000.

Ballard Medical Products: *See*—
Ballard, Dale H., 285,627, Cl. D4-120.000.

Bchakjian, Henry. Arabic font. 285,701, 9-16-86, Cl. D18-25.000.

Becton, Dickinson and Company: *See*—
Franchere, Larry A., 285,725, Cl. D24-56.000.

Bova, Anthony J. Waterbed air purging valve. 285,716, 9-16-86, Cl. D23-19.000.

Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, to Arrow Plastic Manufacturing Co. Scraping device. 285,639, 9-16-86, Cl. D7-99.000.

Brantingham, Mark, to Brantingham, Mark. Walking stilt. 285,715, 9-16-86, Cl. D21-72.000.

Bridgestone Tire Company Limited: *See*—
Igarashi, Toshio; and Nishio, Hideaki, 285,672, Cl. D12-151.000.

Brockmann, Virgil C., to Nicholas, Anita L.; and Nicholas, Edward R. Wind chime. 285,669, 9-16-86, Cl. D10-116.000.

Brown, Perry W., to Sween Corporation. Combined bottle and dispensing pump for hand lotion or the like. 285,652, 9-16-86, Cl. D9-300.000.

Brownbill, Thomas D., to Metal Box p.l.c. Container closure. 285,661, 9-16-86, Cl. D9-435.000.
Bulwick, Helen C., to Sanca International Inc. Cosmetics applicator. 285,730, 9-16-86, Cl. D28-7.000.
Burrell, Alfred A. Label holder for pegboard display unit. 285,704, 9-16-86, Cl. D20-43.000.
Canyon Corporation: *See*—
Tada, Tetsuya, 285,714, Cl. D23-18.000.
Cassina S.p.A.: *See*—
Rodriquez, Rodrigo, 285,630, Cl. D6-367.000.
Cavalli, Alfredo. Combined steam iron support, water tank and cord support. 285,739, 9-16-86, Cl. D32-73.000.
Cederberg, Howard R., to Northern Telecom Limited. Switching exchange for telephone and/or data communication. 285,680, 9-16-86, Cl. D13-32.000.
Chambers, Richard F. Asphalt plant control house. 285,726, 9-16-86, Cl. D25-22.000.
Champion, Douglas A., to Dart Industries Inc. Combined packaging container and lid. 285,656, 9-16-86, Cl. D9-352.000.
Chandler, Maurice P., to General Motors Corporation. Wheel cover. 285,675, 9-16-86, Cl. D12-209.000.
Citizen Watch Co., Ltd.: *See*—
Kano, Hayao, 285,662, Cl. D10-39.000.
Clark, David I., to General Motors Corporation. Wheel cover. 285,676, 9-16-86, Cl. D12-209.000.
Cloverline, Inc., The: *See*—
Leopoldi, Norbert, 285,699, Cl. D16-135.000.
Cohen, Bruce: *See*—
Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, 285,639, Cl. D7-99.000.
Cohen, James: *See*—
Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, 285,639, Cl. D7-99.000.
Conlon, Daniel R. Laboratory hood. 285,719, 9-16-86, Cl. D23-151.000.
Cooper, James M., to Parmellee Industries, Inc. Disposable face mask. 285,733, 9-16-86, Cl. D29-8.000.
Cowan, Keith B.: *See*—
Winegard, John R.; and Cowan, Keith B., 285,685, Cl. D14-90.000.
Cronsioe, Jan-Olof H. Carrying case. 285,660, 9-16-86, Cl. D9-420.000.
Dart Industries: *See*—
Schmidt, Janice L., 285,640, Cl. D7-99.000.
Dart Industries Inc.: *See*—
Champion, Douglas A., 285,656, Cl. D9-352.000.
Trivison, Jody A., 285,638, Cl. D7-27.000.
Zieff, Mark P.; and Wolff, Martin J., 285,637, Cl. D7-9.000.
Decker, David E. Clip holder. 285,703, 9-16-86, Cl. D19-75.000.
Delta Corp., Inc.: *See*—
Seely, Zane E., 285,736, Cl. D32-41.000.
Dideriksen, Erling T., to Interlego A.G. Toy construction piece. 285,705, 9-16-86, Cl. D21-108.000.
Dideriksen, Erling T., to Interlego A.G. Toy construction piece. 285,707, 9-16-86, Cl. D21-108.000.
Diecut Group, The: *See*—
Post, Hans G., 285,666, Cl. D10-46.100.
Doerner, Frank. Chair control. 285,633, 9-16-86, Cl. D6-500.000.
Dominguez, Henry L.: *See*—
Thieme, Allan R.; Dominguez, Henry L.; Piziks, Indulis; and Elson, Ronald D., 285,671, Cl. D12-131.000.
Drazen, Alan S., to Simco Sales Service of Pennsylvania, Inc. Ice cream sandwich. 285,620, 9-16-86, Cl. D1-101.000.
Elson, Ronald D.: *See*—
Thieme, Allan R.; Dominguez, Henry L.; Piziks, Indulis; and Elson, Ronald D., 285,671, Cl. D12-131.000.
Encon Industries, Inc.: *See*—
Markwardt, Michael A., 285,720, Cl. D23-158.000.
Forrest, William E., to Advanced Evauation Systems, Inc. Personnel evacuation body harness. 285,623, 9-16-86, Cl. D2-27.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,653, 9-16-86, Cl. D9-349.000.
Fortuna, Vincent E.: *See*—
MacLaughlin, Donald N.; and Fortuna, Vincent E., 285,655, Cl. D9-349.000.
Franchere, Larry A., to Becton, Dickinson and Company. Culture flask or the like. 285,725, 9-16-86, Cl. D24-56.000.
Franck, Klaus; and Sauer, Werner, to Wilkhahn Wilkening & Hahne GmbH & Co. Arm-chair. 285,629, 9-16-86, Cl. D6-366.000.
Fraser, Simon B.; Porsche, Ferdinand A.; and Schmauser, Dirk, to Optyl Eyewear Fashion International Corporation. Eyeglasses. 285,697, 9-16-86, Cl. D16-116.000.
Fratta, Peter J. Cylindrical pin wrench. 285,645, 9-16-86, Cl. D8-21.000.
Friend, Terence M.: *See*—
Nichols, Peter G.; Tedd, David C.; Friend, Terence M.; and Steggall, Christopher L., 285,663, Cl. D10-79.000.
Garneau, Richard P., to AFA Corporation, The. Sprayer. 285,713, 9-16-86, Cl. D23-17.000.
General Mills, Inc.: *See*—
Manderfield, Ellen B., 285,643, Cl. D7-150.000.
Richmond, Colin B., II, 285,641, Cl. D7-137.000.
General Motors Corporation: *See*—
Chandler, Maurice P., 285,675, Cl. D12-209.000.
Clark, David I., 285,676, Cl. D12-209.000.
Menking, Robert L., 285,677, Cl. D12-211.000.
Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Tumbler or similar article. 285,636, 9-16-86, Cl. D7-6.000.
Green, Paul F. Swimming pool intrusion alarm. 285,665, 9-16-86, Cl. D10-106.000.
Greene, Lynne. Lady's lingerie or similar article. 285,621, 9-16-86, Cl. D2-7.000.
Greene, Lynne. Lady's lingerie or similar article. 285,622, 9-16-86, Cl. D2-7.000.
Grundler, Gottfried: *See*—
Grundler, Helmut; and Grundler, Gottfried, 285,724, Cl. D24-36.000.
Grundler, Helmut; and Grundler, Gottfried, to Actifit, Inc. Hand-held massager. 285,724, 9-16-86, Cl. D24-36.000.
Hahn, Richard F.; and Soby, John P. Combination pulley and weight anchor device. 285,646, 9-16-86, Cl. D8-360.000.
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Support for drill powered abrasive apparatus. 285,693, 9-16-86, Cl. D15-125.000.
Hanyu, Michio, to Hukuba Kogyo Kabushiki Kaisha. Carpet sweeper. 285,735, 9-16-86, Cl. D32-38.000.
Hartshorne, John M.: *See*—
Adams, Peter D.; and Hartshorne, John M., 285,717, Cl. D23-19.000.
Haruguchi, Kenichi; Yamamoto, Sachio; and Tsukata, Akira, to Sharp Corporation. Vacuum cleaner. 285,734, 9-16-86, Cl. D32-21.000.
Henkels, Walter. Table calendar. 285,702, 9-16-86, Cl. D19-20.000.
Hirsh Company: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 285,693, Cl. D15-125.000.
Hoepfner, Thomas L.; and Leistikow, Keith A. Combined grass collector and blower. 285,690, 9-16-86, Cl. D15-17.000.
Holloway, Thomas F., to Risdon Corporation. Cosmetic container. 285,732, 9-16-86, Cl. D28-85.000.
Hukuba Kogyo Kabushiki Kaisha: *See*—
Hanyu, Michio, 285,735, Cl. D32-38.000.
Igarashi, Toshio; and Nishio, Hideaki, to Bridgestone Tire Company Limited. Vehicle tire. 285,672, 9-16-86, Cl. D12-151.000.
Igloo Corporation: *See*—
Katz, Stanley A., 285,658, Cl. D9-378.000.
Ino, Seiichi: *See*—
Suzuki, Toshiro; and Ino, Seiichi, 285,678, Cl. D12-307.000.
Interlego A.G.: *See*—
Dideriksen, Erling T., 285,705, Cl. D21-108.000.
Dideriksen, Erling T., 285,707, Cl. D21-108.000.
Knudsen, Jens N., 285,706, Cl. D21-108.000.
International Business Machines Corporation: *See*—
Kelley, Ted F., Jr.; Kneale, Collan B.; and Mendel, Peter J., 285,689, Cl. D14-113.000.
Iwata Bolt Kogyo Kabushiki Kaisha: *See*—
Iwata, Yukichi; and Suzuki, Yasuo, 285,651, Cl. D8-387.000.
Iwata, Yukichi; and Suzuki, Yasuo, to Iwata Bolt Kogyo Kabushiki Kaisha; Kabushiki Kaisha Suzuki Rashi Seisakusho; and Sony Kabushiki Kaisha. Bolt. 285,651, 9-16-86, Cl. D8-387.000.
J & G Importing Inc.: *See*—
Pali, Loretto, 285,631, Cl. D6-390.000.
Jobs, Steven P.: *See*—
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., 285,687, Cl. D14-106.000.
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., 285,688, Cl. D14-106.000.
Johansson, Hans A. V., to Arjo Instrument AB. Bathtub. 285,718, 9-16-86, Cl. D23-56.000.
John Manufacturing Limited: *See*—
Yuen, John S., 285,727, Cl. D26-42.000.
Johnson, William M., to Ralph McKay Limited. Agricultural implement. 285,691, 9-16-86, Cl. D15-29.000.
Kabushiki Kaisha Suzuki Rashi Seisakusho: *See*—
Iwata, Yukichi; and Suzuki, Yasuo, 285,651, Cl. D8-387.000.
Kachler, Robert S. Water vehicle. 285,679, 9-16-86, Cl. D12-309.000.
Kano, Hayao, to Citizen Watch Co., Ltd. Wrist watch. 285,662, 9-16-86, Cl. D10-39.000.
Katz, Stanley A., to Igloo Corporation. Container for refrigerant gel or the like. 285,658, 9-16-86, Cl. D9-378.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Suzuki, Toshiro; and Ino, Seiichi, 285,678, Cl. D12-307.000.
Kawata, Yoshiaki: *See*—
Akita, Tsugio; Kawata, Yoshiaki; and Uematsu, Toyoyuki, 285,684, Cl. D14-80.000.
Kelley, Ted F., Jr.; Kneale, Collan B.; and Mendel, Peter J., to International Business Machines Corporation. Display station for a data processing system. 285,689, 9-16-86, Cl. D14-113.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 285,625, 9-16-86, Cl. D2-422.000.
Kitakaze, Jyoji; and Oka. Yoshio, to Sanyo Electric Co., Ltd. Pressure cooker. 285,644, 9-16-86, Cl. D7-358.000.
Kleckauskas, Robert: *See*—
Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, 285,639, Cl. D7-99.000.
Kneale, Collan B.: *See*—
Kelley, Ted F., Jr.; Kneale, Collan B.; and Mendel, Peter J., 285,689, Cl. D14-113.000.
Knochner, Michael: *See*—
Stutzer, Franz A.; and Knochner, Michael, 285,737, Cl. D32-70.000.
Knudsen, Jens N., to Interlego A.G. Toy construction piece. 285,706, 9-16-86, Cl. D21-108.000.
Kobee, Frank R., to Trend Carolina Textiles, Inc. Woodwork connecting joint. 285,649, 9-16-86, Cl. D8-382.000.
Kowa Company Ltd.: *See*—
Ogasawara, Takeo, 285,698, Cl. D16-132.000.

Kujawski, Stanley M., to Quaker Oats Company, The. Lamp base. 285,728, 9-16-86, Cl. D26-94.000.
Lacey, Raymond D., to Avdel Limited. Blind rivet-type fastener. 285,650, 9-16-86, Cl. D8-386.000.
Lamy, Jean-Pierre, to Lamy Optic Industries, Inc. Sunglasses. 285,696, 9-16-86, Cl. D16-102.000.
Lamy Optic Industries, Inc.: *See*—
Lamy, Jean-Pierre, 285,696, Cl. D16-102.000.
Langhart, Christopher D. Dish antenna support. 285,686, 9-16-86, Cl. D14-91.000.
Lee, Peter. Telephone. 285,682, 9-16-86, Cl. D14-53.000.
Leistikow, Keith A.: *See*—
Hoepfner, Thomas L.; and Leistikow, Keith A., 285,690, Cl. D15-17.000.
Leopoldi, Norbert, to Cloverline, Inc., The. Magnifying EKG reader or the like. 285,699, 9-16-86, Cl. D16-135.000.
MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 285,654, 9-16-86, Cl. D9-349.000.
MacLaughlin, Donald N.; and Fortuna, Vincent E., to Vercon, Inc. Packaging container. 285,655, 9-16-86, Cl. D9-349.000.
MacLaughlin, Donald N.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., 285,653, Cl. D9-349.000.
Manderfield, Ellen B., to General Mills, Inc. Spoon or similar article. 285,643, 9-16-86, Cl. D7-150.000.
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., to Manock, Jerrold C. Computer housing. 285,687, 9-16-86, Cl. D14-106.000.
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., to Manock, Jerrold C. Computer housing. 285,688, 9-16-86, Cl. D14-106.000.
Markwardt, Michael A., to Encon Industries, Inc. Ceiling fan. 285,720, 9-16-86, Cl. D23-158.000.
Marschak, Claire M., to Quaker Oats Company, The. Quilt. 285,635, 9-16-86, Cl. D6-603.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Akita, Tsugio; Kawata, Yoshiaki; and Uematsu, Toyoyuki, 285,684, Cl. D14-80.000.
McBean, Ken J. Hanging carrier. 285,634, 9-16-86, Cl. D6-513.000.
Mendel, Peter J.: *See*—
Kelley, Ted F., Jr.; Kneale, Collan B.; and Mendel, Peter J., 285,689, Cl. D14-113.000.
Menking, Robert L., to General Motors Corporation. Vehicle wheel. 285,677, 9-16-86, Cl. D12-211.000.
Metal Box p.l.c.: *See*—
Brownbill, Thomas D., 285,661, Cl. D9-435.000.
Miller, John E., Jr., to Woodmaster Tools, Inc. Scroll saw. 285,695, 9-16-86, Cl. D15-133.000.
Miyazaki, Masaru: *See*—
Satoh, Teizoh; and Miyazaki, Masaru, 285,731, Cl. D28-50.000.
Nakashima, Suemitsu, to Nippon Tsushin Kogyo Kabushiki Kaisha. Electronic intercommunication unit. 285,681, 9-16-86, Cl. D14-92.000.
Nicholas, Anita L.: *See*—
Brockmann, Virgil C., 285,669, Cl. D10-116.000.
Nicholas, Edward R.: *See*—
Brockmann, Virgil C., 285,669, Cl. D10-116.000.
Nichols, Peter G.; Tedd, David C.; Friend, Terence M.; and Steggall, Christopher L., to Thorn EMI Instruments Limited. Electrical measuring instrument. 285,663, 9-16-86, Cl. D10-79.000.
Nippon Tsushin Kogyo Kabushiki Kaisha: *See*—
Nakashima, Suemitsu, 285,681, Cl. D14-92.000.
Nishio, Hideaki: *See*—
Igarashi, Toshio; and Nishio, Hideaki, 285,672, Cl. D12-151.000.
Northern Telecom Limited: *See*—
Cederberg, Howard R., 285,680, Cl. D13-32.000.
Ogasawara, Takeo, to Kowa Company Ltd. Terrestrial telescope. 285,698, 9-16-86, Cl. D16-132.000.
Ogawa, Shinri; and Tanii, Yutaka, to Sanyo Electric Co., Ltd. Steam iron. 285,738, 9-16-86, Cl. D32-70.000.
Oka, Yoshio: *See*—
Kitakaze, Jyoji; and Oka, Yoshio, 285,644, Cl. D7-358.000.
Olovsson, Gunnar. Grinding wheel for a grinding machine. 285,694, 9-16-86, Cl. D15-126.000.
Olson, James B. Dosage device for syringes. 285,722, 9-16-86, Cl. D24-31.000.
Optyl Eyewear Fashion International Corporation: *See*—
Fraser, Simon B.; Porsche, Ferdinand A.; and Schmauser, Dirk, 285,697, Cl. D16-116.000.
Osawa, Yoshio. Badge. 285,670, 9-16-86, Cl. D11-116.000.
Oyama, Terrell A.: *See*—
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., 285,687, Cl. D14-106.000.
Manock, Jerrold C.; Oyama, Terrell A.; and Jobs, Steven P., 285,688, Cl. D14-106.000.
Pali, Loretto, to J & G Importing Inc. Infant's crib. 285,631, 9-16-86, Cl. D6-390.000.
Parker, Robert W.; and Wells, David E., to Reed International PLC. Combined gutter support and jointing bracket. 285,648, 9-16-86, Cl. D8-380.000.
Parmellee Industries, Inc.: *See*—
Cooper, James M., 285,733, Cl. D29-8.000.
Patel, Manharbhai K.: *See*—
Paulovich, John M.; and Patel, Manharbhai K., 285,659, Cl. D9-413.000.
Paul, William. Weight lifting frame. 285,711, 9-16-86, Cl. D21-195.000.
Paulovich, John M.; and Patel, Manharbhai K., to Airwick Industries, Inc. Bottle. 285,659, 9-16-86, Cl. D9-413.000.
Piziks, Indulis: *See*—
Thieme, Allan R.; Dominguez, Henry L.; Piziks, Indulis; and Elson, Ronald D., 285,671, Cl. D12-131.000.
Podall, Robert: *See*—
Brabeck, Gary; Cohen, Bruce; Cohen, James; Kleckauskas, Robert; and Podall, Robert, 285,639, Cl. D7-99.000.
Poore, Albert C. G., to Sterling Drug Inc. Packaging container for wet tissues or the like. 285,657, 9-16-86, Cl. D9-353.000.
Porsche, Ferdinand A.: *See*—
Fraser, Simon B.; Porsche, Ferdinand A.; and Schmauser, Dirk, 285,697, Cl. D16-116.000.
Post, Hans G., to Diecut Group, The. Euchre scoring board. 285,666, 9-16-86, Cl. D10-46.100.
Quadrastat Corporation: *See*—
Adams, Peter D.; and Hartshorne, John M., 285,717, Cl. D23-19.000.
Quaker Oats Company, The: *See*—
Kujawski, Stanley M., 285,728, Cl. D26-94.000.
Marschak, Claire M., 285,635, Cl. D6-603.000.
Ralph McKay Limited: *See*—
Johnson, William M., 285,691, Cl. D15-29.000.
Reed International PLC: *See*—
Parker, Robert W.; and Wells, David E., 285,648, Cl. D8-380.000.
Richmond, Colin B., II, to General Mills, Inc. Spoon or similar article. 285,641, 9-16-86, Cl. D7-137.000.
Risdon Corporation: *See*—
Holloway, Thomas F., 285,732, Cl. D28-85.000.
Rocky Mountain Medical Corporation: *See*—
Rosenbaum, Richard J., 285,624, Cl. D2-234.000.
Rodriquez, Rodrigo, to Cassina S.p.A. Adjustable lounge chair. 285,630, 9-16-86, Cl. D6-367.000.
Rosenbaum, Richard J., to Rocky Mountain Medical Corporation. Phototherapy eye light shield. 285,624, 9-16-86, Cl. D2-234.000.
Rowenta-Werke, GmbH: *See*—
Stutzer, Franz A.; and Knochner, Michael, 285,737, Cl. D32-70.000.
Sachs, Isaac. Drop clamp suspension bracket or similar article. 285,647, 9-16-86, Cl. D8-356.000.
Sanca International Inc.: *See*—
Bulwick, Helen C., 285,730, Cl. D28-7.000.
Sanyo Electric Co., Ltd.: *See*—
Kitakaze, Jyoji; and Oka, Yoshio, 285,644, Cl. D7-358.000.
Ogawa, Shinri; and Tanii, Yutaka, 285,738, Cl. D32-70.000.
Satoh, Teizoh; and Miyazaki, Masaru, to U.S. Philips Corporation. Dry shaver. 285,731, 9-16-86, Cl. D28-50.000.
Sauer, Werner: *See*—
Franck, Klaus; and Sauer, Werner, 285,629, Cl. D6-366.000.
Schmauser, Dirk: *See*—
Fraser, Simon B.; Porsche, Ferdinand A.; and Schmauser, Dirk, 285,697, Cl. D16-116.000.
Schmidt, Janice L., to Dart Industries. Rolling pin or the like. 285,640, 9-16-86, Cl. D7-99.000.
Schroeder, Carolyn A. Toy figure or the like. 285,708, 9-16-86, Cl. D21-155.000.
Schultz, Horst, to AMC International ALFA Metalcraft Corporation. Article of flatware. 285,642, 9-16-86, Cl. D7-137.000.
Seely, Zane E., to Delta Corp., Inc. Water remover. 285,736, 9-16-86, Cl. D32-41.000.
Sharp Corporation: *See*—
Haruguchi, Kenichi; Yamamoto, Sachio; and Tsukata, Akira, 285,734, Cl. D32-21.000.
Shibata, Masamitsu, to Victor Company of Japan, Ltd. Combined video tape recorder and video camera. 285,683, 9-16-86, Cl. D14-78.000.
Simco Sales Service of Pennsylvania, Inc.: *See*—
Drazen, Alan S., 285,620, Cl. D1-101.000.
Simpher, Jo Anne. Arterial pressure bandage. 285,721, 9-16-86, Cl. D24-27.000.
Smith Kline & French Laboratories Limited: *See*—
Tovey, Geoffrey D., 285,729, Cl. D28-2.000.
Soby, John P.: *See*—
Hahn, Richard F.; and Soby, John P., 285,646, Cl. D8-360.000.
Somersett Moon Ltd.: *See*—
Kirk, Alexis V., 285,625, Cl. D2-422.000.
Sony Kabushiki Kaisha: *See*—
Iwata, Yukichi; and Suzuki, Yasuo, 285,651, Cl. D8-387.000.
Steggall, Christopher L.: *See*—
Nichols, Peter G.; Tedd, David C.; Friend, Terence M.; and Steggall, Christopher L., 285,663, Cl. D10-79.000.
Sterling Drug Inc.: *See*—
Poore, Albert C. G., 285,657, Cl. D9-353.000.
Stoneman, Billy H. Hand gun scope mount. 285,712, 9-16-86, Cl. D22-109.000.
Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke, GmbH. Steam iron. 285,737, 9-16-86, Cl. D32-70.000.
Suzuki, Toshiro; and Ino, Seiichi, to Kawasaki Jukogyo Kabushiki Kaisha. Motorboat. 285,678, 9-16-86, Cl. D12-307.000.
Suzuki, Yasuo: *See*—
Iwata, Yukichi; and Suzuki, Yasuo, 285,651, Cl. D8-387.000.
Sween Corporation: *See*—
Brown, Perry W., 285,652, Cl. D9-300.000.
Sylvan, Richard: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 285,693, Cl. D15-125.000.

Tada, Tetsuya, to Canyon Corporation. Sprayer. 285,714, 9-16-86, Cl. D23-18.000.
Tanaka, Fumio; and Yamaguchi, Akio, to Alpine Electronics, Inc. Mobile security unit. 285,667, 9-16-86, Cl. D10-106.000.
Tanaka, Fumio; and Yamaguchi, Akio, to Alpine Electronics, Inc. Mobile security unit. 285,668, 9-16-86, Cl. D10-106.000.
Tanii, Yutaka: *See*—
Ogawa, Shinri; and Tanii, Yutaka, 285,738, Cl. D32-70.000.
Taylor, Joe A. Massager or the like. 285,723, 9-16-86, Cl. D24-36.000.
Tedd, David C.: *See*—
Nichols, Peter G.; Tedd, David C.; Friend, Terence M.; and Steggall, Christopher L., 285,663, Cl. D10-79.000.
Thieme, Allan R.; Dominguez, Henry L.; Piziks, Indulis; and Elson, Ronald D., to Amigo Sales, Inc. Electrically powered three wheeled vehicle for the handicapped. 285,671, 9-16-86, Cl. D12-131.000.
Thorn EMI Instruments Limited: *See*—
Nichols, Peter G.; Tedd, David C.; Friend, Terence M.; and Steggall, Christopher L., 285,663, Cl. D10-79.000.
Tovey, Geoffrey D., to Smith Kline & French Laboratories Limited. Pharmaceutical tablet. 285,729, 9-16-86, Cl. D28-2.000.
Toymaster Industrial Limited: *See*—
Wong, Yam C., 285,709, Cl. D21-162.000.
Wong, Yam C., 285,710, Cl. D21-162.000.
Trend Carolina Textiles, Inc.: *See*—
Kobee, Frank R., 285,649, Cl. D8-382.000.
Trivison, Jody A., to Dart Industries Inc. Food serving tray or the like. 285,638, 9-16-86, Cl. D7-27.000.
Tsukata, Akira: *See*—
Haruguchi, Kenichi; Yamamoto, Sachio; and Tsukata, Akira, 285,734, Cl. D32-21.000.
Uematsu, Toyoyuki: *See*—
Akita, Tsugio; Kawata, Yoshiaki; and Uematsu, Toyoyuki, 285,684, Cl. D14-80.000.
Under Sea Industries, Inc.: *See*—
Applegate, Robert L., Jr., 285,664, Cl. D10-102.000.
U.S. Philips Corporation: *See*—
Satoh, Teizoh; and Miyazaki, Masaru, 285,731, Cl. D28-50.000.
Vercon, Inc.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., 285,653, Cl. D9-349.000.
MacLaughlin, Donald N., 285,654, Cl. D9-349.000.
MacLaughlin, Donald N.; and Fortuna, Vincent E., 285,655, Cl. D9-349.000.
Victor Company of Japan, Ltd.: *See*—
Shibata, Masamitsu, 285,683, Cl. D14-78.000.
Vitaloni, Alberto, to Vitaloni S.p.A. Rear view mirror. 285,674, 9-16-86, Cl. D12-187.000.
Vitaloni S.p.A.: *See*—
Vitaloni, Alberto, 285,674, Cl. D12-187.000.
Waters, John E., to Advanced Plastics, Inc. Truck tool box. 285,673, 9-16-86, Cl. D12-157.000.
Wells, David E.: *See*—
Parker, Robert W.; and Wells, David E., 285,648, Cl. D8-380.000.
White, Michael E. Guitar back protective cover. 285,700, 9-16-86, Cl. D17-20.000.
Wilkhahn Wilkening & Hahne GmbH & Co.: *See*—
Franck, Klaus; and Sauer, Werner, 285,629, Cl. D6-366.000.
Winegard Company: *See*—
Winegard, John R.; and Cowan, Keith B., 285,685, Cl. D14-90.000.
Winegard, John R.; and Cowan, Keith B., to Winegard Company. Satellite dish antenna support split rib. 285,685, 9-16-86, Cl. D14-90.000.
Wolff, Martin J.: *See*—
Zieff, Mark P.; and Wolff, Martin J., 285,637, Cl. D7-9.000.
Wong, Yam C., to Toymaster Industrial Limited. Toy elephant. 285,709, 9-16-86, Cl. D21-162.000.
Wong, Yam C., to Toymaster Industrial Limited. Toy elephant. 285,710, 9-16-86, Cl. D21-162.000.
Woodmaster Tools, Inc.: *See*—
Miller, John E., Jr., 285,695, Cl. D15-133.000.
Yamaguchi, Akio: *See*—
Tanaka, Fumio; and Yamaguchi, Akio, 285,667, Cl. D10-106.000.
Tanaka, Fumio; and Yamaguchi, Akio, 285,668, Cl. D10-106.000.
Yamamoto, Sachio: *See*—
Haruguchi, Kenichi; Yamamoto, Sachio; and Tsukata, Akira, 285,734, Cl. D32-21.000.
Yen, Fu-Cheng. Suitcase or similar article. 285,626, 9-16-86, Cl. D3-76.000.
Yuen, John S., to John Manufacturing Limited. Combined fluorescent lamp, flashlight and twin blinking lamps. 285,727, 9-16-86, Cl. D26-42.000.
Zieff, Mark P.; and Wolff, Martin J., to Dart Industries Inc. Mug or the like. 285,637, 9-16-86, Cl. D7-9.000.
Zola, Colman. Chaise lounge. 285,628, 9-16-86, Cl. D6-361.000.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 16, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69 4,611,353
174 4,611,354
246 4,611,355

CLASS 4

301 4,611,356

CLASS 5

451 4,611,357

CLASS 7

157 4,611,358

CLASS 8

196 4,612,013
452 4,612,014
527 4,612,015
543 4,612,016

CLASS 15

97 B 4,611,359
104.3 SN 4,611,360
104.93 4,611,361
230.15 4,611,362
245 4,611,363
250.22 4,611,364
339 4,611,365

CLASS 19

236 4,611,366

CLASS 24

33 P 4,611,367
116 R 4,611,368
642 4,611,369

CLASS 26

3 4,611,370

CLASS 29

20 4,611,371
25.35 4,611,372
148.4 C 4,611,373
157.1 R 4,611,374
157.3 C 4,611,375
235 4,611,376
407 4,611,377
4,611,378
426.5 4,611,379
430 4,611,380
432 4,611,381
450 4,611,382
568 4,611,383
571 4,611,384
574 4,611,385
576 E 4,611,388
576 W 4,611,386
4,611,387
589 4,611,389
597 4,611,391
599 4,611,390
602 R 4,611,392
4,611,393
611 4,611,394
623.2 4,611,395
623.5 4,611,396
834 4,611,397
841 4,611,398
876 4,611,399

CLASS 30

353 4,611,400
387 4,611,401

CLASS 33

139 4,611,402
169 R 4,611,403
199 R 4,611,404
304 4,611,405
443 4,611,406
471 4,611,407
552 4,611,408

CLASS 34

9 4,611,409
41 4,611,410

CLASS 36

7.5 4,611,411
28 4,611,412
44 4,611,413
120 4,611,414
4,611,415
136 4,611,416

CLASS 37

141 T 4,611,417
4,611,418

CLASS 38

21 4,611,419

CLASS 40

610 4,611,420

CLASS 43

3 4,611,421
21.2 4,611,427
42.36 4,611,422
43.12 4,611,423
100 4,611,424
121 4,611,425
131 4,611,426

CLASS 44

10 B 4,612,017

CLASS 47

86 4,611,428

CLASS 49

55 4,611,431
70 4,611,429
192 4,611,432
199 4,611,430
242 4,611,433
257 4,611,434
374 4,611,435
425 4,611,436

CLASS 51

181 R 4,611,437
206 R 4,611,438

CLASS 52

9 4,611,439
65 4,611,440
81 4,611,441
4,611,442
95 4,611,443
144 4,611,445
145 4,611,444
163 4,611,446
209 4,611,447
239 4,611,448
278 4,611,449
309.4 4,611,450
455 4,611,452
555 4,611,451
667 4,611,453

CLASS 53

307 4,611,454
373 4,611,455
427 4,611,456
429 4,611,457
537 4,611,458

CLASS 55

15 4,612,018
16 4,612,019
40 4,612,020
53 4,612,021
60 4,612,022
80 4,612,024
223 4,612,025
274 4,612,026

CLASS 56

12.7 4,611,459
295 4,611,460
328 R 4,611,461

CLASS 57

263 4,611,462
4,611,463

CLASS 60

39.161 4,611,464
602 4,611,465
714 4,611,466

CLASS 62

55.5 4,611,467
71 4,611,468
100 4,611,469
127 4,611,470
235 4,611,471
499 4,611,472
503 4,611,473
514 R 4,611,474

CLASS 65

1 4,612,027
4.2 4,612,028
32 4,612,023
59.24 4,612,029
91 4,612,030
106 4,612,031
165 4,612,032
313 4,612,033

CLASS 66

207 4,611,475

CLASS 68

158 4,611,476

CLASS 70

164 4,611,478
416 4,611,477

CLASS 71

80 4,612,034
90 4,612,035
91 4,612,036
92 4,612,037
4,612,038

CLASS 72

16 4,611,479
326 4,611,480
347 4,611,481
354 4,611,482
453.02 4,611,483
481 4,611,484

CLASS 73

49.8 4,611,485
64.4 4,611,486
81 4,611,487
182 4,611,488
304 C 4,611,489
505 4,611,490
517 B 4,611,491
579 4,611,492
606 4,611,493
626 4,611,494
634 4,611,495
861.27 4,611,496
862.33 B1 4,356,732
862.68 4,611,497
864.41 4,611,498

CLASS 74

6 4,611,499
489 4,611,500
501 M 4,611,501
502 4,611,502
603 4,611,503
695 4,611,504
720.5 4,611,505
794 4,611,506
866 4,611,507

CLASS 75

0.5 AA 4,612,039
10.14 4,612,041
10.65 4,612,040
11 Re.32,247
24 4,612,042
49 4,612,043
4,612,044
68 R 4,612,045
96 4,612,046
246 4,612,048

CLASS 76

24 R 4,611,508
4,611,509

CLASS 81

8.1 4,611,510
9.44 4,611,511
53.1 4,611,512
53.2 4,611,513
60 4,611,514
454 4,611,515

CLASS 82

1.2 4,611,516

CLASS 83

56 4,611,517
105 4,611,518
389 4,611,519
549 4,611,520
796 4,611,521

CLASS 84

1.01 4,611,522
313 4,611,523

CLASS 89

36.01 4,611,524
193 4,611,525

CLASS 91

369 A 4,611,526
420 4,611,527
442 4,611,528
499 4,611,529

CLASS 92

13.5 4,611,530

CLASS 98

39.1 4,611,531

CLASS 99

628 4,611,532

CLASS 100

7 4,611,533
26 4,611,534
43 4,611,535

CLASS 101

93.21 4,611,536
111 4,611,537
365 4,611,538
401.1 4,611,539

CLASS 102

372 4,611,540

CLASS 104

2 4,611,541
173 ST 4,611,542

CLASS 106

14.13 4,612,049
18.12 4,612,050
30 4,612,051
31 4,612,052
264 4,612,054
287.11 4,612,055

CLASS 110

245 B1 4,159,682
263 4,611,543
341 4,611,544

CLASS 111

52 4,611,545

CLASS 112

121.27 4,611,546
254 4,611,547
311 4,611,548

CLASS 114

144 E 4,611,549
230 4,611,550
339 4,611,551
343 4,611,552

CLASS 118

50 4,611,553
316 4,611,554
323 4,611,695
684 4,611,555

CLASS 119

29 4,611,556

CLASS 123

25 B 4,611,557
90.16 4,611,558
196 A 4,611,559
339 4,611,560
360 4,611,561
440 4,611,562
449 4,611,563
478 4,611,564
479 4,611,565
506 4,611,566
545 4,611,567
559 4,611,568
600 4,611,569
601 4,611,570

CLASS 124

7 4,611,571

CLASS 126

77 4,611,572
153 4,611,573
201 4,611,574
438 4,611,575
440 4,611,576
444 4,611,577

CLASS 128

1 D 4,611,578
11 4,611,579
69 4,611,580
4,611,581
4,611,582
76.5 4,611,583
79 4,611,584
91 A 4,611,585
92 A 4,611,586
92 E 4,611,587
132 R 4,611,588
202.26 4,611,589
203.14 4,611,590
205.24 4,611,591
321 4,611,592
325 4,611,593
328 4,611,594
334 R 4,611,595
419 F 4,611,597
419 R 4,611,596
4,611,598
422 4,611,599
667 4,611,600
673 4,611,601
747 4,611,602
775 4,611,603
784 4,611,604

CLASS 130

23 4,611,605
4,611,606

CLASS 131

336 4,611,607
354 4,611,608

CLASS 132

38 R 4,611,609
39 4,611,610
88.7 4,611,611

CLASS 134

6 4,612,056
13 4,612,057
38 4,612,058
65 4,611,612
95 4,611,613
107 4,611,614

CLASS 136

244 4,612,408
4,612,409
256 4,612,410
265 4,612,411

CLASS 137

13 4,611,615
15.1 4,611,616
68.1 4,611,617
4,611,618
82 4,611,619
100 4,611,620
115 4,611,621
145 4,611,622
210 4,611,623
318 4,611,624
505.25 4,611,625
509 4,611,628
588 4,611,627
594 4,611,626
614.21 4,611,629
625.37 4,611,630
625.65 4,611,631
4,611,632

CLASS 138

26 4,611,633
31 4,611,634
146 4,611,635
153 4,611,636

CLASS 139

192 4,611,637
304 4,611,638
383 A 4,611,639

CLASS 140

92.3 4,611,640

CLASS 141

4 4,611,641
114 4,611,642
311 R 4,611,643

CLASS 142

7 4,611,644

CLASS 144

117 R 4,611,646

CLASS 148

4 4,612,059
6.15 Z 4,612,060
6.35 4,612,061
11.5 N 4,612,062
12 B 4,612,063
13 4,612,064
16 4,612,065
20.3 4,612,066
127 4,612,070
131 4,612,071
175 4,612,072
301 4,612,068
325 4,612,069
329 4,612,067
415 4,612,073

CLASS 152

209 B 4,611,647

CLASS 156

85 4,612,074
242 4,612,075
249 4,612,076
345 4,612,077
493 4,612,078
497 4,612,079
504 4,612,080
583.1 4,612,081
607 4,612,082
633 4,612,083
639 4,612,084
643 4,612,085

CLASS 159

6.1 4,612,086

CLASS 160

107 4,611,648

CLASS 162

129 4,612,087
235 4,612,088
336 4,612,089

CLASS 164

108 4,611,649
298 4,611,650
464 4,611,651

CLASS 165

1 4,611,652
54 4,611,653
104.22 4,611,654
163 4,611,655

CLASS 166

65.1 4,611,656
88 4,611,657
134 4,611,658
274 4,611,659
297 4,611,660
339 4,611,661
4,611,662
382 4,611,663
902 4,611,664

CLASS 169

37 4,611,665

CLASS 172

13 4,611,666
40 4,611,667
134 4,611,668

545 4,611,669

CLASS 173

162 H 4,611,671

CLASS 174

65 R 4,612,412

CLASS 175

116 4,611,670
339 4,611,672
340 4,611,673

CLASS 177

1 4,611,674
4,611,675
50 4,611,676
187 4,611,677
211 4,611,678

CLASS 178

22.08 4,612,413

CLASS 179

1.5 R 4,612,414
2 EB 4,612,415
6.11 4,612,416
77 4,612,417
81 R 4,612,418
90 D 4,612,419
115.5 PV 4,612,420
175 4,612,421

CLASS 180

68.3 4,611,679
69.24 4,611,680
73.4 4,611,681
79.1 4,611,682
209 4,611,683
223 4,611,684

CLASS 181

102 4,611,685
156 4,611,686
286 4,611,687

CLASS 182

237 4,611,688

CLASS 187

29 R 4,611,689

CLASS 188

24.11 4,611,690
71.8 4,611,691
73.1 4,611,692
73.34 4,611,693
73.45 4,611,694

CLASS 192

0.076 4,611,699
13 A 4,611,696
21.5 4,611,697
30 W 4,611,698
98 4,611,700
110 B 4,611,701
110 R 4,611,702
135 4,611,703

CLASS 198

345 4,611,704
425 4,611,705
443 4,611,706
468.2 4,611,707
750 4,611,708
764 4,611,709
80..01 4,611,710

CLASS 200

5 R 4,612,422
16 R 4,612,423
50 A 4,612,424
61.55 4,612,425
144 R 4,612,426
4,612,427
148 R 4,612,428
288 4,612,429
327 4,612,430

CLASS 202

176 4,612,090

CLASS 204

51 4,612,091
59 R 4,612,092
92.32 4,612,099
111 4,612,093
141.5 4,612,094
144.5 4,612,095
157.2 4,612,097
157.46 4,612,096
181.7 4,612,098
192.15 4,612,100
224 M 4,612,101
228 4,612,102
243 R 4,612,103
272 4,612,104
286 4,612,105
299 R 4,612,106
300 EC 4,612,107

CLASS 206

0.81 4,611,711
198 4,611,712
349 4,611,713
387 4,611,714
484 4,611,715
581 4,611,716

CLASS 208

111 4,612,108
131 4,612,109
251 H 4,612,110
350 4,612,111

CLASS 209

166 4,612,112
170 4,612,113
172 4,612,114

CLASS 210

163 Re.32,248
189 4,612,115
333.1 4,612,116
393 4,612,117
490 4,612,118
500.23 4,612,119
512.1 4,612,120
635 4,612,121
638 4,612,122
709 4,612,123
721 4,612,124
724 4,612,125
787 4,612,126

CLASS 211

34 4,611,717
49.1 4,611,718
50 4,611,719
60.1 4,611,720
100 4,611,721
107 4,611,722

CLASS 215

252 4,611,723

CLASS 219

10.55 E 4,612,431
121 PG 4,612,432
216 4,612,433
273 4,612,434

CLASS 220

5 A 4,611,724
253 4,611,725
408 4,611,726

CLASS 221

63 4,611,728
154 4,611,727

CLASS 222

63 B1 4,275,822
75 4,611,729
167 4,611,730
636 4,611,731
639 4,611,732

CLASS 223

75 4,611,733

CLASS 224

42.42 4,611,734

CLASS 225

96.5 4,611,735

CLASS 226

74 4,611,737
134 4,611,736

CLASS 227

9 4,611,738
66 4,611,739
67 4,611,740
99 4,611,741
131 4,611,742

CLASS 228

49.1 4,611,743
119 4,611,744
123 4,611,745
4,611,746
125 4,611,747
170 4,611,748
176 4,611,749
184 4,611,750
4,611,751
194 4,611,752

CLASS 229

17 R 4,611,753
40 4,611,754

CLASS 235

144 DM 4,612,435
449 4,612,436

CLASS 236

12.12 4,611,757
13 4,611,755
49 4,611,756

CLASS 239

119 4,611,758
229 4,611,759
233 4,611,760
284 R 4,611,761
708 4,611,762

CLASS 241

30 4,611,763
39 4,611,764
121 4,611,765
207 4,611,766

CLASS 242

18 DD 4,611,767
55.3 4,611,768
56.9 4,611,769
107.4 D 4,611,770
129.5 4,611,645

CLASS 244

3.12 4,611,771
3.16 4,611,772
35 R 4,611,773
54 4,611,774

CLASS 246

28 F 4,611,775

CLASS 248

228 4,611,776
371 4,611,777
429 4,611,778
476 4,611,779
477 4,611,780
526 4,611,781
562 4,611,782
588 4,611,783

CLASS 249

20 4,611,784

CLASS 250

201 4,612,437
206 4,612,438
256 4,612,439
281 4,612,440
342 4,612,441
353 4,612,442
362 4,612,443
492.1 4,612,444
551 4,612,445
570 4,612,446

CLASS 251

4 4,611,785
118 4,611,786
363 4,611,788

CLASS 252

32.5 4,612,127
4,612,128
33.6 4,612,129
39 4,612,130
48.6 4,612,131
51.5 A 4,612,132
68 4,612,133
75 4,612,134
106 4,612,135
134 4,612,136
174.19 4,612,137
313.2 4,612,138
511 4,612,139
520 4,612,140
546 4,612,141
555 4,612,142

CLASS 254

267 4,611,787

CLASS 264

1.5 4,612,144
22 4,612,145
29.6 4,612,146
46.1 4,612,147
49 4,612,148
101 4,612,149
103 4,612,150
105 4,612,151
136 4,612,152
154 4,612,153
176 R 4,612,155
4,612,156
176.2 4,612,154
185 4,612,157

CLASS 266

81 4,611,789
235 4,611,790
263 4,611,791

CLASS 267

52 4,611,793
64.13 4,611,794
140.1 4,611,795
149 4,611,792

CLASS 269

57 4,611,797

CLASS 270

31 4,611,798
52.5 4,611,799

CLASS 271

3.1 4,611,800
150 4,611,801
274 4,611,802

CLASS 272

105 4,611,803
126 4,611,804
132 4,611,807
136 4,611,805
144 4,611,806

CLASS 273

80 B B1 4,470,600
138 A 4,611,808
176 H 4,611,809
218 4,611,810
237 4,611,811
400 4,611,812

CLASS 277

1 4,611,813

CLASS 279

111 4,611,814

CLASS 280

6 R 4,611,815
43.2 4,611,816
145 4,611,817
278 4,611,818
289 WC 4,611,819
414.2 4,611,820
482 4,611,821
615 4,611,822
641 4,611,823
748 4,611,824
808 4,611,825

CLASS 282

8 R 4,611,826

CLASS 285

3 4,611,827
4,611,828
18 4,611,829
22 4,611,830
26 4,611,831
55 4,611,832
4,611,833
131 4,611,834
155 4,611,835
158 4,611,836
305 4,611,837
331 4,611,838
367 4,611,839

CLASS 290

1 R 4,612,447

CLASS 292

177 4,611,840
241 4,611,841

CLASS 294

82.33 4,611,842
86.4 4,611,843
86.41 4,611,844
87.1 4,611,845
88 4,611,846

CLASS 296

1 S 4,611,796
4,611,847
98 4,611,848
201 4,611,849
4,611,850

CLASS 297

199 4,611,851
352 4,611,852
379 4,611,853
468 4,611,854

CLASS 299

2 4,611,855
4,611,856
14 4,611,857

CLASS 303

6 R 4,611,858
100 4,611,859

CLASS 305

43 4,611,860

CLASS 307

252 C 4,612,449
252 G 4,612,448
264 4,612,450
270 4,612,451
300 4,612,452
303 4,612,453
311 4,612,454
419 4,612,455
425 4,612,456
443 4,612,457
446 4,612,458
468 4,612,459
475 4,612,460
4,612,461
482 4,612,462
490 4,612,463
496 4,612,464
584 4,612,465
585 4,612,466

CLASS 310

27 4,612,467
67 R 4,612,468
90.5 4,611,863
93 4,612,469
273 4,612,470
321 4,612,471
339 4,612,472

CLASS 312

12 4,611,864
114 4,611,865
257 R 4,611,866

CLASS 313

111 4,612,473
414 4,612,474
640 4,612,475

CLASS 315

3.6 4,612,476
111.21 4,612,477
176 4,612,478
194 4,612,479
209 R B1 3,360,683
224 4,612,480
370 4,612,481
371 4,612,482
376 4,612,483
384 4,612,484

CLASS 318

5 4,612,485
254 4,612,486
568 4,612,487
582 4,612,488
590 4,612,489
761 4,612,490

CLASS 320

2 4,612,491
3 4,612,492
64 4,612,493

CLASS 322

4 4,612,494
100 4,612,495

CLASS 323

315 4,612,496
4,612,497

CLASS 324

52 4,612,498
73 R 4,612,499
96 4,612,500
208 4,612,501
4,612,502
4,612,503
309 4,612,504
318 4,612,505
348 4,612,506

CLASS 328

169 4,612,507

CLASS 329

50 4,612,508
4,612,509
107 4,612,510
124 4,612,511

CLASS 330

66 4,612,512
261 4,612,513
277 4,612,514

CLASS 331

1 A 4,612,515
11 4,612,516
46 4,612,517

CLASS 332

21 4,612,518

CLASS 333

103 4,612,519
156 4,612,520
165 4,612,521
4,612,522

CLASS 335

26 4,612,523
210 4,612,524
213 4,612,525
229 4,612,526

CLASS 336

5 4,612,527

CLASS 337

79 4,612,528
255 4,612,529

CLASS 339

14 R 4,611,867
59 M 4,611,868
75 MP 4,611,869
4,611,870
93 C 4,611,871
94 M 4,611,872
4,611,873
97 R 4,611,874
154 A 4,611,875
186 M 4,611,878
198 H 4,611,879
206 R 4,611,880
263 R 4,611,876

CLASS 340

63 4,612,530
347 AD 4,612,531
347 CC 4,612,533
347 DD 4,612,532
505 4,612,534
539 4,612,535
552 4,612,536
596 4,612,537
679 4,612,538
710 4,612,539
793 4,612,540
825.05 4,612,541
825.5 4,612,542

CLASS 343

5 DP 4,612,544
5 R 4,612,543
18 E 4,612,545
352 4,612,546
372 4,612,547
373 4,612,548
379 4,612,549
756 4,612,550
765 4,612,551
880 4,612,552

CLASS 346

1.1 4,612,553
140 R 4,612,554
160 4,612,555
215 4,612,556
216 4,612,557
221 4,612,558

CLASS 350

6.9 4,611,881
96.12 4,611,883
96.15 4,611,884
96.20 4,611,885
4,611,886
96.21 4,611,887
96.22 4,611,888
174 4,611,877
337 4,611,889
357 4,611,890
613 4,611,891

CLASS 351

159 4,611,892
239 4,611,893

CLASS 352

114 4,611,894

CLASS 354

159 4,611,895
173.11 4,611,896
475 4,611,897
484 4,611,898

CLASS 355

3 DD 4,611,899
4,611,900
3 FU 4,611,902
4 4,611,901
14 D 4,611,905
14 R 4,611,903
4,611,906
14 SH 4,611,904
41 4,611,907
55 4,611,908
56 4,611,909

CLASS 356

1 4,611,910
5 4,611,911
4,611,912

37 S 4,611,917
127 4,611,913
141 4,611,914
318 4,611,920
349 4,611,915
4,611,916
357 4,611,919
404 4,611,918

CLASS 357

2 4,612,559
22 4,612,560
38 4,612,561
4,612,562
40 4,612,563
70 4,612,564
71 4,612,565
80 4,611,882
4,612,566

CLASS 358

11 4,612,567
19 4,612,568
22 4,612,569
36 4,612,570
86 4,612,571
111 4,612,572
140 4,612,573
158 4,612,574
160 4,612,575
171 4,612,576
172 4,612,577
212 4,612,578
213 4,612,579
4,612,580
4,612,581
237 4,612,582
250 4,612,583
299 4,612,584
316 4,612,585

CLASS 360

31 4,612,586
59 4,612,587
78 4,612,588
90 4,612,589
91 4,612,590
93 4,612,591
106 4,612,592
130.31 4,612,593

CLASS 361

68 4,612,594
93 4,612,595
146 4,612,596
152 4,612,597
227 4,612,598
283 4,612,599
321 4,612,600
387 4,612,601
394 4,612,602
419 4,612,603
724 4,612,625

CLASS 362

19 4,612,604
32 4,612,605
146 4,612,606
267 4,612,607
297 4,612,608
306 4,612,609

CLASS 363

26 4,612,610
49 4,612,611

CLASS 364

200 4,612,612
4,612,613
415 4,612,614
431.02 4,612,616
431.07 4,612,615
483 4,612,617
490 4,612,618
492 4,612,619
494 4,612,621
551 4,612,620
560 4,612,622
569 4,612,623
581 4,612,624
726 4,612,626
736 4,612,627
748 4,612,628

CLASS 365

185 4,612,629
201 4,612,630
203 4,612,631
226 4,612,632

CLASS 366

156 4,611,921
221 4,611,922

CLASS 367

115 4,612,633

CLASS 368

10 4,611,923
4,611,924
28 4,611,925
120 4,611,926
188 4,611,927

CLASS 370

58 4,612,634
89 4,612,635
94 4,612,636
95 4,612,637

CLASS 371

15 4,612,638
25 4,612,639
51 4,612,640

CLASS 372

25 4,612,641
33 4,612,642
38 4,612,643
44 4,612,644
45 4,612,645
58 4,612,646
88 4,612,647
109 4,612,648

CLASS 373

45 4,612,649
108 4,612,650
130 4,612,651

CLASS 374

21 4,611,928
124 4,611,929
126 4,611,930

CLASS 375

1 4,612,652
23 4,612,653
30 4,612,654

CLASS 376

250 4,612,158
351 4,612,159

CLASS 377

16 4,612,655
24 4,612,656
32 4,612,657
52 4,612,658
72 4,612,659

CLASS 378

44 4,612,660
177 4,612,661

CLASS 381

10 4,612,662
24 4,612,663
70 4,612,664
98 4,612,665

CLASS 382

32 4,612,666

CLASS 384

49 4,611,861
477 4,611,931
481 4,611,932
512 4,611,933
517 4,611,934
548 4,611,935

CLASS 400

120 4,611,936
208 4,611,937
212 4,611,938
637 4,611,939
649 4,611,940

CLASS 401

207 4,611,941

CLASS 402

79 4,611,942

CLASS 403

22 4,611,943
60 4,611,944
61 4,611,945
102 4,611,946
104 4,611,947
232.1 4,611,948

CLASS 404

9 4,611,949

CLASS 405

128 4,611,950
4,611,951
224 4,611,952
4,611,953
261 4,611,954

CLASS 406

31 4,611,955

CLASS 408

108 4,611,957
168 4,611,958
180 4,611,959

CLASS 409

26 4,611,956
234 4,611,960

CLASS 410

20 4,611,961
57 4,611,962

CLASS 411

54 4,611,963
356 4,611,964

CLASS 414

299 4,611,965
404 4,611,966
411 4,611,967
563 4,611,968

CLASS 415

1 4,611,969
6 4,611,970

CLASS 416

114 4,611,971
214 R 4,611,972

CLASS 417

342 4,611,973
388 4,611,974

CLASS 418

5 4,611,975
76 4,611,977
159 4,611,976

CLASS 419

2 4,612,160
3 4,612,161
28 4,612,162
68 4,612,163

CLASS 420

83 4,612,047
455 4,612,164
459 4,612,165
470 4,612,166
471 4,612,167
587 4,612,168

CLASS 422

32 4,612,169
46 4,612,170

CLASS 423

22 4,612,171
56 4,612,172
170 4,612,173
210 4,612,174
235 4,612,175
240 4,612,176
244 4,612,177
338 4,612,178
348 4,612,179
593 4,612,180
4,612,181
4,612,182
4,612,183
626 4,612,184

CLASS 424

2 4,612,185
15 4,612,186
16 4,612,187
47 4,612,188
49 4,612,189
4,612,190
52 4,612,191
70 4,612,192
146 4,612,193
195.1 4,612,194

CLASS 425

73 4,611,978
131.1 4,611,987
376 R 4,611,979
435 4,611,980
529 4,611,981
543 4,611,982
544 4,611,983

CLASS 426

3 4,612,195
14 4,612,196
47 4,612,197
94 4,612,198
237 4,612,199
242 4,612,200
511 4,612,201
548 4,612,202
589 4,612,203
590 4,612,204
599 4,612,205

CLASS 427

9 4,612,206
19 R 4,612,215
39 4,612,207
53.1 4,612,208
54.1 4,612,209
82 4,612,210
86 4,612,211
91 4,612,212
126.6 4,612,213
136 4,612,214
250 4,612,216
255.1 4,612,217

CLASS 428

8 4,612,218
4,612,219
33 4,612,220
35 4,612,221
4,612,222
4,612,223
109 4,612,224
116 4,612,225
134 4,612,226
137 4,612,227
151 4,612,228
155 4,612,229
167 4,612,230
4,612,231
172 4,612,232
206 4,612,233
215 4,612,234
216 4,612,235
4,612,236
219 4,612,237
228 4,612,238
246 4,612,239
289 4,612,240
294 4,612,241
313.9 4,612,242
321.3 4,612,243
323 4,612,244
340 4,612,245
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402 4,612,247
419 4,612,248
424.8 4,612,249
500 4,612,250
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521 4,612,253
531 4,612,254
541 4,612,255
547 4,612,256
620 4,612,257
4,612,258
661 4,612,259
667 4,612,260

CLASS 429

13 4,612,261
14 4,612,262
104 4,612,263
114 4,612,264
196 4,612,265
221 4,612,266

CLASS 430

3 4,612,267
28 4,612,268
49 4,612,269
72 4,612,271
98 4,612,272
4,612,273
233 4,612,277
273 4,612,270
296 4,612,274
4,612,275
302 4,612,276
381 4,612,278
523 4,612,279
621 4,612,280

CLASS 431

19 4,611,984
240 4,611,985
320 4,611,986

CLASS 432

121 4,611,989
183 4,611,988

CLASS 433

60 4,611,991
116 4,611,992
129 4,611,990

CLASS 434

21 4,611,993
85 4,611,994
157 4,611,995
202 4,611,996
236 4,611,997
265 4,611,998

CLASS 435

7 4,612,281
68 4,612,282
4,612,283
96 4,612,284
128 4,612,285
157 4,612,286
172.3 4,612,287
180 4,612,288

CLASS 436

34 4,612,289
97 4,612,290
174 4,612,291

CLASS 440

47 4,611,999

CLASS 445

6 4,612,000

CLASS 446

208 4,612,001

CLASS 455

98 4,612,667
120 4,612,668
123 4,612,669
607 4,612,670
609 4,612,671

CLASS 474

28 4,612,002
4,612,003
80 4,612,004
201 4,612,005

CLASS 493

342 4,612,006

CLASS 501

27 4,612,292
40 4,612,294
51 4,612,295
93 4,612,296
97 4,612,297

CLASS 502

28 4,612,293
65 4,612,298
104 4,612,299
113 4,612,300
154 4,612,301

CLASS 514

11 4,612,302
23 4,612,303
53 4,612,304
80 4,612,305
112 4,612,306
147 4,612,307
167 4,612,308
212 4,612,309
222 4,612,310
4,612,311
225 4,612,312
255 4,612,313
261 4,612,314
263 4,612,315
290 4,612,316
292 4,612,317
293 4,612,318
305 4,612,319
317 4,612,320
338 4,612,321
383 4,612,322
394 4,612,323
400 4,612,324
413 4,612,325
443 4,612,326
479 4,612,327
515 4,612,328
523 4,612,329
557 4,612,330
558 4,612,331

CLASS 521

65 4,612,332
83 4,612,333
146 4,612,334
167 4,612,335

CLASS 522

3 4,612,336

CLASS 523

113 4,612,337
414 4,612,338

CLASS 524

84 4,612,339
296 4,612,340
331 4,612,341
450 4,612,342
547 4,612,343
601 4,612,344
733 4,612,345

CLASS 525

66 4,612,346
73 4,612,347
86 4,612,348
117 4,612,349
177 4,612,350
199 4,612,351
404 4,612,352
432 4,612,353

CLASS 526

62 4,612,354
65 4,612,355
243 4,612,356
247 4,612,357
259 4,612,358

CLASS 528

97 4,612,359
182 4,612,360
185 4,612,361
190 4,612,362
274 4,612,363
491 4,612,364

CLASS 530

301 4,612,365
311 4,612,366
399 4,612,367

CLASS 534

578 4,612,368
689 4,612,369

CLASS 536

5 4,612,370
6.4 4,612,371
7.1 4,612,372
120 4,612,373

CLASS 544

222 4,612,374
311 4,612,375
317 4,612,376

CLASS 546

345 4,612,377

CLASS 548

170 4,612,378

CLASS 549

274 4,612,379
415 4,612,380
560 4,612,381

CLASS 556

173 4,612,382
412 4,612,383

CLASS 558

198 4,612,384
282 4,612,143

CLASS 560

12 4,612,385
86 4,612,386
232 4,612,387

CLASS 562

443 4,612,388
513 4,612,389
522 4,612,390
577 4,612,391

CLASS 564

207 4,612,392
245 4,612,395
300 4,612,393
420 4,612,394
441 4,612,396
479 4,612,397

CLASS 568

73 4,612,398
324 4,612,399
333 4,612,400
362 4,612,401
408 4,612,402
454 4,612,403
730 4,612,404
916 4,612,405

CLASS 585

329 4,612,406
434 4,612,407

CLASS 604

5 4,612,007
51 B1 4,078,564
207 4,612,010
891 4,612,009
892 4,612,008

CLASS 623

2 4,612,011
5 4,612,012

CLASS 706

35 4,612,053

D1—	101	285,620
D2—	7	285,621
		285,622
	27	285,623
	234	285,624
	422	285,625
D3—	76	285,626
D4—	120	285,627
D6—	361	285,628
	366	285,629
	367	285,630
	390	285,631
	474	285,632
	500	285,633
	513	285,634
	603	285,635
D7—	6	285,636
	9	285,637
	27	285,638
	99	285,639
		285,640
	137	285,641
		285,642
	150	285,643
	358	285,644
D8—	21	285,645
	356	285,647
	360	285,646
	380	285,648
	382	285,649
	386	285,650
	387	285,651
D9—	300	285,652
	349	285,653
		285,654
		285,655
	352	285,656
	353	285,657
	378	285,658
	413	285,659
	420	285,660
	435	285,661
D10—	39	285,662
	46.1	285,666
	79	285,663
	102	285,664
	106	285,665
		285,667
		285,668
	116	285,669
D11—		285,670
D12—	131	285,671
	151	285,672
	157	285,673
	187	285,674
	209	285,675
		285,676
	211	285,677
	307	285,678
	309	285,679
D13—	32	285,680
D14—	53	285,682
	78	285,683
	80	285,684
	90	285,685
	91	285,686
	92	285,681
	106	285,687
		285,688
	113	285,689
D15—	17	285,690
	29	285,691
	81	285,692
	125	285,693
	126	285,694
	133	285,695
D16—	102	285,696
	116	285,697
	132	285,698
	135	285,699
D17—	20	285,700
D18—	25	285,701
D19—	20	285,702
	75	285,703
D20—	43	285,704
D21—	72	285,715
	108	285,705
		285,706
		285,707
	155	285,708
	162	285,709
		285,710
	195	285,711
D22—	109	285,712
D23—	17	285,713
	18	285,714
	19	285,716
		285,717
	56	285,718
	151	285,719
	158	285,720
D24—	27	285,721
	31	285,722
	36	285,723
		285,724
	56	285,725
D25—	22	285,726
D26—	42	285,727
	94	285,728
D28—	2	285,729
	7	285,730
	50	285,731
	85	285,732
D29—	8	285,733
D32—	21	285,734
	38	285,735
	41	285,736
	70	285,737
		285,738
	73	285,739

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,611,354	4,611,913	4,612,227	4,612,509	4,612,473	4,612,315
	4,611,439	4,611,915	4,612,416	4,612,582	4,612,571	4,612,342
	4,611,571	4,611,919	4,612,609	13 : 4,611,546	4,612,595	4,612,491
	4,611,771	4,611,945	09 : 4,611,464	4,611,573	4,612,596	4,612,520
	4,612,244	4,611,953	4,611,543	4,611,645	4,612,619	4,612,533
02 :	4,611,822	4,611,990	4,611,588	4,611,964	4,612,639	4,612,642
04 :	4,611,389	4,611,996	4,611,736	4,612,054	4,612,651	25 : 4,611,353
	4,611,722	4,612,008	4,611,748	4,612,224	18 : 4,611,374	4,611,408
	4,611,804	4,612,056	4,611,813	4,612,648	4,611,392	4,611,467
	4,611,806	4,612,072	4,611,960	15 : 4,611,355	4,611,440	4,611,478
	4,611,807	4,612,076	4,612,050	16 : 4,611,422	4,611,441	4,611,513
	4,611,865	4,612,079	4,612,077	4,611,592	4,611,532	4,611,610
	4,611,871	4,612,130	4,612,098	4,611,617	4,611,596	4,611,688
	4,612,168	4,612,132	4,612,122	4,611,891	4,611,667	4,611,723
	4,612,274	4,612,161	4,612,135	17 : 4,611,406	4,611,680	4,611,737
	4,612,626	4,612,170	4,612,166	4,611,469	4,611,696	4,611,805
05 :	4,611,717	4,612,176	4,612,239	4,611,477	4,611,721	4,611,816
	4,611,965	4,612,179	4,612,262	4,611,480	4,611,747	4,611,834
06 :	4,611,360	4,612,186	4,612,263	4,611,502	4,611,776	4,611,851
	4,611,363	4,612,210	4,612,353	4,611,505	4,611,809	4,611,884
	4,611,384	4,612,257	4,612,374	4,611,523	4,611,824	4,611,888
	4,611,387	4,612,258	4,612,400	4,611,594	4,611,841	4,612,000
	4,611,399	4,612,314	4,612,412	4,611,612	4,611,847	4,612,096
	4,611,400	4,612,325	4,612,485	4,611,613	4,611,981	4,612,213
	4,611,405	4,612,350	4,612,622	4,611.619	4,612,221	4,612,217
	4,611,418	4,612,370	10 : 4,612,057	4,611,632	4,612,291	4,612,247
	4,611,424	4,612,383	4,612,154	4,611,643	4,612,330	4,612,302
	4,611,426	4,612,408	4,612,237	4,611,649	4,612,367	4,612,360
	4,611,429	4,612,411	4,612,241	4,611,709	4,612,577	4,612,361
	4,611,442	4,612,432	4,612,357	4,611,719	4,612,597	4,612,532
	4,611,515	4,612,458	4,612,368	4,611,788	4,612,649	4,612,538
	4,611,519	4,612,507	11 : 4,612,028	4,611,812	19 : 4,611,535	4,612,548
	4,611,586	4,612,512	12 : 4,611,404	4,611,820	4,611,605	4,612,563
	4,611,587	4,612,517	4,611,423	4,611,826	4,611,606	4,612,613
	4,611,593	4,612,522	4,611,451	4,611,852	4,611,713	4,612,628
	4,611,595	4,612,534	4,611,577	4,611,972	4,611,860	4,612,645
	4,611,601	4,612,543	4,611,584	4,611,975	4,612,047	4,612,654
	4,611,609	4,612,545	4,611,600	4,612,011	20 : 4,611,603	26 : 4,611,367
	4,611,620	4,612,546	4,611,611	4,612,046	21 : 4,611,607	4,611,373
	4,611,626	4,612,586	4,611,624	4,612,078	4,611,648	4,611,375
	4,611,661	4,612,610	4,611,641	4,612,125	4,612,298	4,611,448
	4,611,663	4,612,612	4,611,706	4,612,138	4,612,478	4,611,474
	4,611,677	4,612,614	4,611,863	4,612,175	22 : 4,611,623	4,611,501
	4,611,761	4,612,629	4,611,870	4,612,177	4,612,398	4,611,506
	4,611,787	4,612,640	4,611,951	4,612,225	4,612,617	4,611,527
	4,611,802	4,612,643	4,612,022	4,612,265	4,612,661	4,611,528
	4,611,803	4,612,647	4,612,075	4,612,269	23 : 4,611,724	4,611,580
	4,611,817	4,470,600	4,612,337	4,612,272	24 : 4,611,388	4,611,618
	4,611,823	08 : Re.32,247	4,612,419	4,612,273	4,611,729	4,611,640
	4,611,835	4,611,446	4,612,444	4,612,284	4,611,993	4,611,681
	4,611,855	4,611,714	4,612,467	4,612,287	4,612,053	4,611,694
	4,611,856	4,611,890	4,612,470	4,612,299	4,612,233	4,611,743
	4,611,883	4,611,912	4,612,482	4,612,415	4,612,276	4,611,770

4,611,780
4,611,797
4,611,840
4,611,854
4,612,019
4,612,025
4,612,149
4,612,216
4,612,338
4,612,348
4,612,386
4,612,434
4,612,489
4,612,498
4,612,501
4,612,526
4,612,632
4,612,638
4,612,644
27 : 4,611,395
4,611,421
4,611,452
4,611,492
4,611,511
4,611,627
4,611,687
4,611,716
4,611,857
4,611,941
4,612,052
4,612,198
4,612,242
4,612,375
4,612,403
4,612,481
4,612,664
28 : 4,611,529
4,611,929
29 : 4,611,447
4,611,460
4,611,510
4,611,622
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